A STUDY OF THE INFLUENCE OF TEACHER PARTICIPATION IN AN IN-SERVICE PROGRAM OF CHILD STUDY UPON PUPIL ACHIEVEMENT

by
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Thesis submitted to the Faculty of the Graduate School of the University of Maryland in partial fulfillment of the requirements for the degree of Doctor of Education

1951

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ACKNOWLEDGEMENTS

The writer wishes to express sincere appreciation to those who were of assistance in the development of this study. He is especially grateful to his research committee composed of Dr. Daniel A. Prescott, Director of the Institute for Child Study at the University of Maryland; Dr. H. Gerthon Morgan, Professor of Education at the University of Maryland; and Dr. R. Lee Hornbake, Professor of Industrial Education at the University of Maryland. These persons supplied valuable guidance and assistance in formulating, organizing, and carrying out the problem.

It is an especial privilege to make mention of the kind assistance of Miss Evelyn R. Girardin, Assistant Director of Elementary Curriculum, Department of Education, Baltimore, Maryland. In addition to securing permission for the author to conduct this study, Miss Girardin was of great aid in working out many of the important details connected with the investigation.

The writer wishes to acknowledge the inspiring influence of his family and particularly his wife. These people in no little way contributed to the completion of the project.

Walter B. Waetjen
May, 1951

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CHAPTER I

INTRODUCTION

At the present time, thousands of teachers in all regions of the United States are making direct studies of their pupils in new and technical ways. The Institute for Child Study of the University of Maryland alone has a field program with more than seven thousand teachers investigating physiological, cultural, and psychological forces that affect the lives and learning of particular children in their classes.

How does this specific study by teachers in the field influence the effectiveness of teaching and learning? Does the program of child study affect the skills of reading and arithmetic regarded by many citizens as the hallmarks of good schooling? Are the teachers just learning to talk with one another in more erudite fashion, or are they actually becoming more competent members of their profession?

The present dissertation is a report of an attempt to secure a partial answer to these questions. So that the reader may get a comprehensive picture of the child study program, a brief history of its development will be discussed in this chapter. In Chapter III of this investigation a description of the procedures and experiences of each year-level of the program will be presented.

Brief History of the Child Study Program. The Commission on Teacher Education, created by the American Council on Education and aided by grants from the General Education Board, began a five-year program in 1939 designed to improve both the

pre-service and in-service education of teachers. Participating cooperatively in this program of experimentation were fourteen groups of school systems, several state systems of education and twenty collegiate institutions.[1]

The Division on Child Development and Teacher Personnel headed by Prescott was one of the important agencies started by the Commission on Teacher Education. The Division, with headquarters at the University of Chicago, had a two-fold program: a "collaboration center" for gathering and synthesizing the findings of recent research in child growth and development, and a field program providing consultant service to the cooperating collegiate institutions and public school systems.

Numerous types of recent research findings pertaining to the learning, growth, behavior, and adjustment of children were compiled at the collaboration center at the University of Chicago. These research materials were obtained from most of the major child development research centers in the country, such as the centers at the University of Iowa, the Fels Foundation, and the Brush Foundation. Personnel concerned with the education of teachers in the school systems and collegiate institutions working with the Commission were invited to the collaboration center for extended periods of time in order to synthesize the research findings. The collaborators also availed themselves of the services of experts in the various

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[1]Daniel A. Prescott, "Communicating Knowledge of Children to Teachers", Child Development, Vol. XIX, Nos. 1 and 2 (March-June 1948), pp. 15-24.

social and biological sciences conducting research at the University of Chicago. As a result of these experiences the majority of the collaborators formulated an integrated set of scientific principles that described and explained the various processes in human development, growth, and behavior. Many of the principles developed by the collaborators were considered to be essential knowledge for pre-service and in-service teachers

In addition to working with research materials the collaborators engaged in other types of activities designed to enhance their formulation of comprehensive syntheses. They studied children in the public schools, held individual conferences with faculty members, and made field trips with consultants serving the various school systems participating in the work of the Division.

Experimentation with techniques for helping teachers to gain a better understanding of the children in their respective classrooms was widely practiced in the field program of the cooperating school system serviced by consultants. Some of the techniques attempted were lectures to teacher groups by experts from the different sciences, systematic study programs led by collaborators, and the dissemination of published scientific information explaining the causes of human growth, behavior, and adjustment. Each of these proved to be of some value to the teachers; yet, they continued to look for techniques that would give them a better understanding of the processes and principles underlying the behavior of the children they were teaching.

Work with the teacher groups in the school systems followed no standardized procedure. Each group, or school system was free to use the techniques or procedures which it thought would be of most value to it. One of the participating school systems used a unique approach in developing its program. The teachers of this system selected an individual child and studied his behavior over a period of time, usually a year. They reported their findings frequently to the other teachers in their child study group. The work of the groups in this particular school system has been described in a report[2] to the Commission on Teacher Education.

These teachers gathered information about the child from many different sources: school records, conferences with other teachers and with parents, home visits, and descriptions of the child's behavior obtained by direct observation. Participating teachers joined on-going child study groups with membership in each group varying from eight to sixteen. Here each teacher presented information about the child selected for study and the group evaluated the material in terms of what it revealed about the child's growth, development, motivation, and behavior. Later, after sufficient data about a child had been gathered by each teacher, the whole group participated verbally in the analysis of the information seeking explanations or causes for the behavior

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[2]American Council on Education, Helping Teachers Understand Children. Washington, D.C.: American Council on Education, 1945.

that had been observed and described.

When the work of the Commission on Teacher Education terminated, the University of Chicago continued the operation of the Collaboration Center and the Field Program of Child Study. About this time the State Department of Education and the county administrators of Maryland started a child study program as one phase of a long-term program of curriculum development. Later the city of Baltimore developed its own child study program. Consultants from the University of Chicago supplied the necessary direction to both the state-wide child study program and the Baltimore city program.

Prescott, who had directed the work of the Division on Child Development and Teacher Personnel, left the University of Chicago in 1947 to establish the Institute for Child Study at the University of Maryland.

The purposes of the Institute for Child Study, broadly defined, were two-fold: to continue the work of helping teachers to understand children by maintaining and developing the field program of child study, and to establish a program of graduate studies in the principles of human growth and development in order to educate persons who could develop child study programes in other collegiate institutions and public school systems.

The Institute for Child Study has supplied consultant service to the State of Maryland, including Baltimore; Philadelphia, several centers in Louisiana and Texas, and several counties in Georgia. These few centers are mentioned merely

to give some idea of the scope of the Field Program. The average number of participating teachers for any one year has been approximately five thousand.

As is true in any field of endeavor, research is needed to analyze operating procedures, and to evaluate outcomes so that the necessary direction is afforded the particular undertaking. Unfortunately, the child study program has never had adequate research procedures paralleling its development to test its effectiveness.

The first attempt to evaluate the program took place in the center in which it originally was developed. This evaluation is described in the volume, Helping Teachers Understand Children.[3]

Teachers, supervisors, and principals submitted written statements describing the way in which the program had benefited them. Scientific concepts explaining the causes of human behavior were acquired by nearly everyone. Changes in attitudes toward children and modifications in instructional procedures and materials were reported by many. Of particular importance to this thesis is a statement made by the writers reporting the results of the evaluation. After reproducing some of the teachers' statements, they write:

> . . . we have seen teachers cutting down on the academic demands made of immature children, finding ways of helping children who were shy, lazy, disturbing to other children, restless, aggravating, and

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[3] Ibid., Chapter XI.

> uninterested. In each case adequate scholastic achievement ensued or appeared probable.[4]

Of late, advanced graduate students at the Universities of Chicago and Maryland have attempted to answer some of the questions relating to child study experiences. The research studies that have been done pertain primarily to the changes that occur in teachers as a result of participation in the child study program. These studies reveal that significant changes take place in teachers in terms of their objectivity in observing and recording descriptions of behavior, and in the degree of understanding of human behavior. Little systematic attention has been directed toward discovering the changes that take place in children as a result of teacher participation in the child study program. Especially is this true of measuring changes in scholastic achievement.

A review of these research studies will be presented here in order to direct attention toward the need for the present investigation. The studies will be described in some detail so that the reader may understand the nature and scope of the research already completed and that currently in progress.

The general purpose of the investigation conducted by Perkins[5] was to examine group learning situations in order to determine the effects of social-emotional climate, previous experience in child study, and curriculum on three selected

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[4] Ibid., p. 389

[5] Hugh V. Perkins, The Effects of Social-Emotional Climate and Curriculum on Group Learning of In-Service Teachers. Unpublished Doctor's Dissertation, University of Chicago, 1949.

aspects of learning: knowledge of scientific concepts which assist in explaining behavior, changes in attitudes toward children, and mental processes used.

Data for the study consisted of recordings and transcriptions made of the meetings of six child study groups during the school year 1947-1948. The teacher-members of those groups were participants in an in-service teacher education program in child study carried on by the Institute for Child Study of the University of Maryland. The group members were professional personnel of school systems in Montgomery, Prince Georges, and Anne Arundel Counties, Maryland; Washington, D.C.; and Baltimore City, Maryland.

Two of the six groups were engaged in first year child study, two were doing second year, and two were doing the third year of child study. Selection was made of one group at each year-level near the extreme of group-centeredness and another near the extreme of leader-centeredness by making use of Withall's[6] instrument for determining the social-emotional climate of groups. An instrument for categorizing statements of participants in child study groups was developed and used in analyzing the data collected in the study.

The general hypotheses for the study were:

> (1) Gains in concepts, attitude change, and type of mental process used and expressed in the group will be greater in the group-centered groups than in the leader-centered groups at each year level.

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[6]John G. Withall, The Development of a Technique for the Measurement of Social-Emotional Climate in the Classroom. Unpublished Doctor's Dissertation, University of Chicago, 1948.

(2) The largest evident attitude change will take place in first year groups.

(3) The largest evident increase in acquisition of concepts will take place in second year groups.

(4) The largest evident shift in mental process used toward the inclusion of objective evidence in support of a statement will take place during the period of group interpretation of case records.[7]

This study indicated that differences in the social-emotional climates of the child study groups resulted in significant differences in group learning and group interaction. It further indicated that expected learnings did take place at each year level of the three-year in-service program of child study.

Participants in second year study groups had a significantly higher ratio of stated concepts to total responses than did participants in first year groups.

Superiority of first year groups in largest evident changes in attitude had been predicted; however, the data revealed that second year groups were significantly superior in the greater proportion of objective and warm attitudes which participants expressed.

The evidence in the study supported the conclusions that the climate in which learning occurs is a strong determinant of the quality and quantity of group learning. Group-centered groups expressed a significantly higher ratio of child development concepts to total responses, and a significantly higher proportion of warm and objective attitudes

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[7]Hugh V. Perkins, op. cit., p. 152

toward children.

Mershon[8] sought to determine what changes take place in teachers' records after two years of child study, in terms of the form of recording, in the sources used for gathering information about a child, and in the scope of the information. Briefly stated, the hypothesis tested in this study was that teachers are able to learn in two years' time the nature of the information they need about individual children, where and how to get this information, and how to record it objectively within the situation in which it occurred.

The data for this investigation were obtained from a random sampling of forty first year records written by teachers in two child study centers. These were matched with the second-year records written by the same teachers. Check lists were used to tabulate objective and subjective materials in the records, to tabulate the number of sources tapped for information about a child, and to tabulate the facts classified under each area of the six-area framework (These six areas are reviewed in Chapter III.).

The findings disclose that teachers develop skill in recording information more objectively in two years of child study. This skill is developed slowly during the latter part of the first year. In two years of child study teachers develop an awareness of the importance of tapping sources of information in addition to the classroom sources. This awareness becomes apparent at the beginning of the second year.

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[8]Madelaine J. Mershon, Changes in the Records Made by Teachers During Two Years in a Child Study Program. Unpublished Ph.D. Dissertation, University of Chicago, 1950.

Teachers also record an increasingly greater number of facts about children during two years of child study.

The investigator concluded that the study revealed the operational procedures to be effective in promoting the development of skills to gather and record information about children which embraced the qualities deemed important for the purposes of the child study program.

A piece of research similar to the one just described was done by Reaves[9]. He endeavored to ascertain whether teachers were recording the behavior of children differently after being engaged in a program of child study. Specifically, he attempted to discover, (1) how the number of incidents recorded in the first half of a record differed from the incidents recorded in the second half, and (2) the content emphasis in each half of a record for each year a teacher kept a record.

The anecdotal records were selected from those written by teachers in the child study program in Corpus Christi, Texas. Five teachers who had kept records for each of their three years of participation in child study provided the total of fifteen records used in the research.

The findings point out that four out of five of the teachers recorded more incidents in the latter half of the record than they did in the first half. It was also found that in the latter half of the record the teachers were

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[9]O. Lee Reaves, An Analysis of Teachers' Anecdotal Records. Unpublished Master's Thesis, University of Texas, 1950.

recording the behavior of children in all of the six areas (these six areas are explained in detail in Chapter III) to a greater degree than in the first half of the record. During the first year the greatest number of incidents were classified in the Self-Developmental area; this dropped in the second year and rose slightly in the third. In every case the number of anecdotes containing teacher opinion decreased as the teachers continued in the program.

Reaves presented his concluding remarks in the form of hypotheses which are summarized below.

1. After being engaged in the child study program teachers become more conscious of the sources from which to gather information about a child.

2. Teachers become more skillful in recording factual descriptions of behavior.

3. The material recorded increased in complexity as time elapsed.

A study currently underway by Murphy[10] proposes to secure reactions to the child study program from a sampling of eighty first-year participants in eighteen Texas schools to be followed by another set of reactions at the end of their second year of participation. These reactions are being gathered by means of interviews, with substantiation obtained through observation and questionnaires, as well as by examination of the child study records kept by the persons interviewed. Teachers are being asked to express reactions

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[10]Alton C. Murphy, An Analysis of Reactions to Child Study Expressed By Teachers. Doctoral dissertation in progress, University of Maryland.

to the child study program in Texas in terms of its outcomes, methods of operation, the mechanics of time, place and frequency of meetings, adequacy of library facilities, and effectiveness of consultant service.

The investigation is for the purpose of ascertaining relationships between the expressed reactions and such items as year-level of participation, age, sex, and marital status of the teachers. In addition, there are tentative plans to examine the geographical area of the state, socio-economic conditions under which the teachers operate, and administrative reactions to the program.

It becomes increasingly apparent in reviewing the foregoing studies that the investigators have dealt with the learnings of teachers and the way in which a program of child study affects them. The only work done along the lines of discovering the program's impact upon children's achievement was a rather general evaluation conducted in one of the first child study centers.

Administrators and teachers have often asked visiting consultants how child study affects the achievement of children. Through the insights and understandings developed in the child study program, most of the participants have been able to note the growth of children in extra-intellectual areas of achievement. They, by the very nature of their questions, have been unable to distinquish changes in the trends of growth in areas of scholastic achievement. A question that arises from this problem is: "Does teaching prove more effective in skill-subject areas if teachers have a basic understanding of human

growth, development and behavior?" The question as stated assumes that the teachers have taken part in the on-going in-service program of child study sponsored by the Institute for Child Study of the University of Maryland.

Statement of the Problem. The purpose of this investigation is to determine the influence of teachers' participation in three years of an in-service program of child study on certain pupil achievements. Achievement will be measured in the skill areas of reading and arithmetic by means of scores made on standardized group tests. Scores made on group intelligence tests are also used to indicate changes in intelligence quotients during the experimental period. The statement of the null hypothesis is: "There is no increase in pupil achievement resulting from teacher participation in three years of an in-service program of child study."

Specifically, this study will compare the achievement of children in reading and arithmetic, and changes in intelligence quotients in experimental and control classes in certain fifth grade classes of the public schools of Baltimore, Maryland.

The problem breaks down into specific aspects, stated below in the form of questions. The answers to these questions will shed light on the main hypothesis.

1. Are there differences in reading achievement and arithmetic achievement of pupils in the 70-89 I.Q. group, in the 90-109 I.Q. group, and the group having intelligence quotients over 110, resulting from teacher participation in the child study program?

2. Are there changes in reading achievement, arithmetic achievement, or intelligence quotient when children of selected sub-cultural

groups have had a child-study teacher?

3. What is the influence of the child-study teacher on children of the different social classes as regards achievement in reading and arithmetic and change in the intelligence quotient?

4. What affect have the child-study teachers had on the level of experimental group reading and arithmetic achievement when grade expectancy has been determined by mental age?

5. Have the pupils in the experimental group had better attendance during the experimental period than pupils of the control group?

The last question is considered in this study only because attendance could, conceivably, have some affect on level of achievement. Children having poor attendance records are often presented with fewer opportunities for learning in skill subjects, which could affect performance on achievement tests.

Further Evidence of Need. The selected problems in human development education in this study have assumed significance for these and other reasons:

1. Although numerous studies have been made of the effect on teachers of understanding human behavior, little has been done to determine how this understanding effects children's learning of subject matter in skill-areas.

2. Pre-service and in-service courses designed to aid teachers in understanding human behavior have been almost universally accepted by educators as necessary and desirable for teachers.

3. The studies that deal with pupil growth in skill areas indicate a relatively short term of teacher preparation

in the understanding of human behavior. It is felt that because the teachers involved in this study had education in the understanding of human behavior that was unique with a particular field situation involving three years of direct observation of children, it needed separate study. Such unique features include: the writing of specific, objective and comprehensive descriptions of child behavior; the classification and analysis of the behavior; and the recognition of the child's developmental tasks from the analysis.

4. The objectives and goals of education in the present-day democratic society have been fairly well defined. The current need is for the definition of patterns of teaching and types of teacher education which will lead to the realization of the established goals.

Assumptions. For purposes of explanation and clarification several basic assumptions underlying this study are presented.

1. The techniques and procedures used in selecting the schools and children for this study were valid and adequate for purposes of the study.

2. The Index of Status Characteristics, used for predicting social class, was valid and adequate for purposes of this study.

3. The responses obtained from the Index of Status Characteristics were correct statements of fact, and the judges responding were capable of providing the information.

4. The scores on standarized group tests, used to measure pupil achievement in reading, arithmetic and intelli-

gence, are valid and reliable indications of pupil achievement.

5. Teachers are exposed to influences other than child study in their selection of in-service courses. Child Study is, therefore, non-selective in and of itself in this particular situation.

6. The statistical techniques and procedures used in the study are valid and adequate for purposes of the study.

7. The conditions under which the tests were administered were uniform; therefore, the derived data are reliable and valid.

Evidence obtained from such a study should prove to be of significance to educators in evaluating certain pupil changes that take place as a result of teachers' participation in an in-service program of child study.

It is the purpose of the next chapter to summarize the evidence obtained from earlier research pertaining to the relationship between teacher knowledge of human behavior and the scholastic achievement of pupils. Chapter III of this study will be a presentation of the design of the experiment and the procedures used in carrying out the investigation. The results of the study will be discussed in Chapter IV, followed by the summary and conclusions in Chapter V.

CHAPTER II

A REVIEW OF THE LITERATURE

During the last two decades significant changes have occurred in the nature of educational research. One of the changes is from the investigation of external factors influencing learning to the investigation of more internal or human factors and the effect these have on the acquisition of knowledge. Some of the research has explored the relationship between teachers' understanding of human behavior and the scholastic achievement of their pupils. Since this research has direct reference to the immediate problem it is summarized here.

In this review of literature several considerations pertain. There are no outstanding studies to date directly relevant to this topic. This is probably due to the fact that the type of in-service program sponsored by the Institute for Child Study of the University of Maryland is relatively new on the educational scene. On the other hand, it does appear that many of the studies dealing with the influence of particular and limited aspects of behavior on scholastic achievement have a distinct relationship to the present problem. They are therefore included in this review. It is further felt that the review of studies and literature in these kindred aspects of human growth, development, and behavior, add breadth of understanding and suggestions for methodology to this particular investigation. The materials presented in

this chapter, therefore, describe participating teachers who have had types of educational experiences in studying the principles of human growth and development that were quite different from those of the teachers involved in this study.

The studies in this section will be reviewed in two units. To be presented first will be general statements concerning the values of teacher-pupil relationships and the affect these have on learning. These statements are included in this chapter in order to add concepts and points-of-view.

The second unit is a digest of the various studies and articles appearing in periodicals. Each of the studies is reviewed in some detail in order to facilitate a more complete understanding of the purpose, procedures, and findings.

Following these two units, a summary is presented from the findings, conclusions, and implications derived from the literature reviewed.

Teacher-Pupil Relationships. A perusal of almost any history of education textbook reveals the emotional climate in which students were thought to learn best. Punishment and fear-motivation were common educational techniques thought to enhance effective learning. The bases for these practices are buried deep in history, philosophy, and the prevailing psychology of the particular time. Modern educational thought, however, has placed increasingly stronger emphasis on the quality of interpersonal relationships existing between the teacher and the learner. Educational jargon has termed this the "pupil-teacher relationship". Conceivably, there are two facets to this point of view, (1) the value that educators

place upon the warmth and acceptance of pupils, and (2) the manner in which students react to teachers who foster a warm climate of affection in their classrooms.

The June, 1937 issue of the Review of Educational Research contains a review of the research relating to the measurement and prediction of teaching success. These studies indicate that the quality of teacher-pupil relationships is of paramount importance. A summary statement reads as follows:

> The fundamental importance of the teacher-pupil relationship is self-evident, because it is essential to the promotion of optimum conditions for learning. Certain attitudes, traits, and procedures are undoubtedly necessary to establish teacher behavior patterns that contribute to wholesome relationships in the classroom.[11]

Another writer undertook to study the effectiveness of teacher personality by observing teacher-pupil relationships. In this connection she says, ". . . above all else teaching demands a human being who is capable of establishing rapport with children and who personally is worthy to be an influencing factor in the environment in which children are growing and to which they are reacting."[12] Statements of this nature are not confined to investigations carried on within the educational world, but are often made on the basis of research involving many facets of the social matrix.

The meetings held at Bethel, Maine, for the purpose

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[11]T. L. Torgerson, "The Measurement and Prediction of Teaching Success." Review of Educational Research. Vol. 7 (June, 1937), p. 246.

[12]Bernice Baxter, Teacher-Pupil Relationships, New York: MacMillan Company, 1941, p. 8.

of studying group relationships and interpersonal relationships are also indicative of current trends of thought in education. These meetings are attended by educators, social scientists, and other responsible action leaders. Specifically, these people are endeavoring to build a science of human relations compatible with our current human problems and to facilitate the application of this science in our society. The findings of the 1947 meeting of this group seem to be particularly important to the problem under consideration. It was found that,

> . . . in all those areas of living where interpersonal and group relations are of paramount importance there are basic skills for stimulating changes in attitudes, behavior, and performance which can be identified, acquired, practiced, and communicated to the end that conflict in group and intergroup life in modern society can be reduced constructively and cooperative learning and action efforts for the common good increased.[13]

The traits, habits, characteristics, and practices of teachers who are most liked and most disliked by children were studied by Tiedeman.[14] The data were obtained from 450 seventh, eighth, and ninth grade children by asking them to write a list of things any teacher had done that they had liked, and that they had greatly disliked.

When tabulated, the data showed that the autocratic teacher was most disliked by pupils. This type of teacher was characterized by her tendency to use ridicule and sarcasm, by

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[13]Faculty of the Training Laboratory in Group Development, "A Laboratory in Educational Dynamics." School and Society. Vol. 66 (1947), pp. 675-79.

[14]Stuart C. Tiedeman, "A Study of Pupil-Teacher Relationships." Journal of Educational Research. Vol. 35 (May 1942) pp. 657-64.

failure to provide for individual differences, and by threatening, frightening and punishing in an effort to effect discipline. Characteristic of the teacher most liked was her willingness to help children and her understanding of children and their problems.

In conclusion, the author wrote a description of the well-liked teacher from the children's responses. The part of the description particularly pertinent to this investigation states that the best liked teacher ". . . understands children and their problems; realizes that all children are not alike, but must be recognized as individuals; . . ."[15]

The conclusion reached by Tiedeman is similar to that of Bush[16] who sought to explore the nature of an effective student-teacher relationship. This investigation was conducted under the auspices of the Stanford Social Education Investigation.

The data were obtained by using many sources of information about 148 students in the social science classes of a boys school in an attempt to provide a comprehensive and accurate description of the relationships existing between these students and their teachers. The information was obtained by using anecdotal records, tests, rating scales and interviews.

From these data the author concluded that the maximum

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[15] Ibid., p. 664

[16] Robert N. Bush, "A Study of Student-Teacher Relationships." Journal of Educational Research. Vol. 35 (May, 1942) pp. 645-56.

student-teacher relationship includes, ". . . keen insight into and objective attitudes toward students and students' problem behavior."[17]

The Influence of Particular Aspects of Behavior on Scholastic Achievement. Some investigators endeavored to find changes in certain educational achievements by studying a particular aspect of human behavior. Typical of these is the study by Atkin and Riggs[18] in which they used sociometric techniques and found the effect of peer group acceptance on achievement in history. The purposes of the experiment were; (1) to locate isolated children, (2) to develop means for drawing them into the group, (3) to observe the effects of personal relationships and achievement, and (4) to observe incidental results.

Two 7A classes were used as the basis for the experiment, one serving as a control group and the other as the experimental group. Since the school grouped its students homogeneously, the authors contend that the two groups were closely related in terms of chronological age, I.Q., and achievement. The writers present data to show comparability in terms of age and intelligence, but do not do so for achievement.

In September 1943 the children were asked to write the

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[17] Ibid., p. 656

[18] Ellen Atkin and Lawrence Riggs, "Sociometric Experiment With Isolated Children in a 7A Junior High Group." Baltimore Bulletin of Education. Vol. 22 (February-March 1945), pp. 95-9.

names of three or four of their best friends on a slip of paper. They were also asked to list the names of individuals they desired as friends. Children who had received not more than one choice were regarded as isolates.

During the school term the teacher used the Baltimore course of study enrichment program in history, involving dramatics, debates, editorials, oral reports, and original poems. Emphasis was placed upon bringing isolated children into active participation within the group. The fundamental outcome of the group activity was always in terms of the meaning the activity had for the isolated child in his relationships. This was done only in the experimental group.

In January 1944, the children again expressed friendship choices and friendships they desired. When compared with the data obtained in September, the following findings were revealed. In September the control-group had two isolates, while it had seven in January. The experimental group had six isolates in September and none in January.

Of the thirty-six pupils in the experimental group, twenty-three had history averages five to ten points higher at the termination of the experimental period, and thirteen pupils had averages exactly the same as before. Six of the thirty-eight pupils in the control group had history averages five points higher in January than in September; twenty-four pupils had averages five to ten points lower than in September, and eight pupils had averages exactly the same as before.

The authors conclude by stating that ". . . this experiment indicates we can do much more to increase achievement

as well as happiness and group solidarity by making effective use of information obtained through sociometric techniques applied to certain aspects of group life."[19]

Two other studies[20] conducted by these same authors produced similar results. Both studies involved 7A children in the public schools of Baltimore, Maryland, and utilized the same techniques in the investigation described above in greater detail. Again, the investigators found that the pupils in the experimental group made gains in their achievement in history.

A more extensive study was done by Ojemann and Wilkinson.[21] The method of the study consisted of selecting thirty-three pupils for each of the experimental and control groups. During the experimental period the teachers of these groups were assisted in making analyses of motives, attitudes, and environmental conditions of the pupils.

The assumption underlying the investigation was that learning becomes more effective and that the development of personality can be more adequately controlled if a careful analysis of pupil behavior is made by the teacher.

The experimental and control groups were equated in terms of chronological age, scores on Otis Group Intelligence

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[19] Ibid., p. 99

[20] Ellen Atkin and Lawrence Riggs, "More Sociometric Experiments at School No. 45." Baltimore Bulletin of Education Vol. 23 (September-October, 1945) pp. 3-7

[21] Ralph Ojemann and Frances Wilkinson, "The Effect on Pupil Growth of an Increase in Teachers' Understanding of Pupil Behavior." Journal of Experimental Education. Vol. 8 (December, 1939) pp. 143-47

test, and achievement of the previous year as measured by grade-points. Comparisons were made in the following areas:

1. school achievement - in terms of grade-points
2. selected attitudes - items relative to the school, the teacher, the home and the self
3. personality conflicts - measured by a revision of Luria's method
4. pupil adjustment - measured by using a general adjustment inventory

The investigators collected data on personality and environmental factors by interviewing parents, and by the use of tests. This was done to discover the ambitions, goals, home behavior, and parental attitudes of the pupils in the experimental group. These data were interpreted by the investigators and communicated to the teachers participating in the study so that they might have a better understanding of the children's behavior. The teacher was then expected to use this knowledge in the conduct of her class and in planning the child's daily work.

The findings of the investigation were as follows:

1. Significantly higher academic gains were made by the experimental group.

2. The data indicated that the experimental group had a happier and more logical attitude toward school work than did the control group.

3. The results of the personality conflict test showed that the children in the control group were experiencing more

difficulty in making adjustments. The children in the experimental group seemed to be moving in the direction of a more objective and impersonal type of mental life.

4. In general, the adjustment inventory supported the findings of the attitude and personality conflict test in that the experimental group showed significant change over the control group.

In conclusion, the investigators felt that the data were consistent in showing that when teachers understood pupil personalities it enhanced achievement in academic areas and the teachers became better guides to learning.

The March, 1946 edition of Childhood Education magazine reviews an experiment[22] designed to improve social relations in a third grade in the Laboratory School of the University of Michigan.

At a staff meeting called to consider the project, the teacher in charge of the group defined the problem and earlier teachers of the class gave the historical perspective. Specialists in the group reported on the physiological and psychological characteristics of the group and its individual members. Further data were obtained by sociometric tests and observation to describe the social structure of the third grade group.

From the information available the staff members made general recommendations for improving the social relationships

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[22]Willard Olson, "The Improvement of Human Relations in the Classroom." Childhood Education. Vol. 22, (March 1946), pp. 317-25

of the children. These included rearrangement of class seating and more parent conferences.

A follow-up study six months later provided a subjective estimate of improvement in the social relations of the group. The teacher reported evidence of good gains in the ability to read and disappointing results in terms of changes on a sociometric test.

Flory, Alden, and Simmons[23] set about to improve the personality adjustment of students in the fourth grade and of the same students in the fifth grade. The students were enrolled in the public schools of Appleton, Wisconsin, during the years 1939-1940.

The California Personality Test was the instrument used to diagnose and to measure growth and development. The Progressive Achievement tests were administered to measure growth in skill areas.

During the year the teachers used their own devices to bring about better personality adjustment. Unfortunately, records of methods used by the teachers were not kept. The conclusions reached were: there was significant improvement in personality adjustment; the gains were the result of the treatment prescribed by the regular classroom teachers without the help of specialists; the amount of gain was twice as great the first year as the second; the five pupils who regressed in their personal adjustments suggested the need for

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[23]Charles Flory, Elizabeth Alden and Madeline Simmons, "Classroom Teachers Improve the Personality Adjustment of Their Pupils." Journal of Educational Research Vol. 38 (September 1944), pp. 1-8

services of child specialists; there was a slight positive relationship between the level of intelligence and amount of gain; and the pupils maintained normal educational achievements.

Fults[24] sought to improve the learning of pupils by helping teachers to establish good human relationships in the classroom. The investigator used thirty-eight pupils in each of the experimental and control groups. The experimental group consisted of three separate classes in home economics.

This study was based on the following assumptions:

1. Teachers could recognize symptoms of learning difficulties and their relationship to multiple and inter-related causes.

2. The important causes in relation to learning were considered to be frustrated needs, conflict in values, inadequate preparation, personal problems, demanding life schedules, poor health, incapacity, and environmental blocks.

3. The needs of people in our culture closely related to learning were: the need for belongingness, the need for love and affection; the need for achievement and recognition; the need for sharing in making decisions affecting one's welfare; and the need for integration of one's attitudes, beliefs and values.

The tests used, before and after the experimental period, were the Ohio Social Acceptance Scale, Committee

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[24]Anna C. Fults, Improving Learning Through an Emphasis on Human Relations in an In-Service Teacher Education Program. Unpublished Doctoral Dissertation, Ohio State University, Columbus, Ohio, 1946.

choices, Who's Who in Home Economics, Problem Check List, Wishing Well, Reading Comprehension Form T Cooperative English Tests, American Council on Education Psychological Examination for High School Students, and California Intelligence Tests, Language Section Intermediate Series. Generally speaking, these were concerned with social acceptance, pupils' problems and needs, intelligence, and reading comprehension.

The teachers in the experimental group were selected because they were considered to be good instructors with good academic education. Each supervised student teachers in home economics. All of the teachers were sensitive to the problems of the investigation and were willing to cooperate.

Regular meetings were held at which time the teachers met with the research worker to study resource materials selected for their value in promoting deeper insight into personality organization and behavior. These resource materials were supplied to the teachers in addition to suggested guides on children's learning difficulties.

Growth in learning was determined by the teachers' observations, anecdotal records, and the application of the "t" test to "before and after" test scores in intelligence, reading, and social acceptability. The statistical findings obtained by use of the "t" test are summarized below in terms of the level of statistical significance.

Experimental Groups

	A. Group	B. Group	C. Group
Social Acceptance	5%	--	1%
Reading	5%	1%	1%
Psychological	5%	--	1%

Control Groups

	D. Group	E. Group	F. Group
Social Acceptance	1%	--	--
Reading	--	5%	--
Psychological	1%	5%	--

Some of the implications that are drawn for pre-service training of teachers are summarized as follows:

1. Pre-service teachers must have an understanding of learning and the learning-teaching process.

2. Teachers must be placed in free learning situations the requirements of which will effect this learning. Better case studies of children will be needed.

3. Teachers will need to develop insights into community life and living.

4. Administrative relations will have to be conducive to further learning.

5. The most significant implication is that a knowledge of all factors relating to learning is required of the teacher who acts on the hypothesis that learning and non-learning has its causes and consequences and that both must be understood in their relation to promoting the growth of children.

In conclusion, Fults states that ". . . a direct attack upon the problem of improving learning through an in-service teacher education program, which emphasized human relations within the group, tended to result in significant increases in social acceptance, reading skills, and intelligence as measured by a psychological test."[25]

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[25] Ibid., p. 373

The purpose of an investigation by Tiedeman[26] was to evaluate the over-all program of the Psycho-Educational Clinic of the University of Wisconsin. Emphasis was placed upon the results of the clinic's program for promoting better adjustment of pupils through an in-service training program of teachers in the methods of studying children.

Some of the evaluative criteria used in the study were as follows: (1) data on functions and practices of other child-study clinics in the United States; (2) judgment of personnel in the cooperating schools regarding the improvement of school practices and conditioning conducive to child study as a result of the clinic's program; (3) results of the clinic's developmental reading program in the cooperating school in increasing pupil's mastery of the basic reading skills in the lower grades; and (4) results of the clinic's program in effecting a general increase in pupils' scholastic achievement.

Information pertaining to the improvement of pupils' basic reading skills, reading achievement, and general scholastic achievement was secured from the records of the clinic's staff and the cooperating schools. The data from the schools were the results obtained from the administration of the Progressive Achievement Test Battery in 1945 and 1946.

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[26]Stuart C. Tiedeman, An Evaluation of the Effectiveness of the Psycho-Educational Clinic of the University of Wisconsin in Promoting Child Study and Better Pupil Adjustments in Four School Systems. Unpublished Doctor's Dissertation, University of Wisconsin, 1946.

Since this review of the literature concerns itself with the scholastic achievement of children, only the results of Tiedeman's study pertaining to achievement will be presented. His investigation appeared to make the following conclusions valid; (1) reading achievement had improved significantly in both vocabulary and comprehension, and (2) the general level of scholastic achievement had risen markedly.

Dugan[27] attempted to determine the influence upon pupil achievement and development of a teacher's knowledge of individual pupil characteristics when these data are interpreted in printed summaries. The null hypothesis was "There is no increase in pupil achievement and development resulting from an increase in teacher knowledge of individual pupil characteristics."

This study compared achievement and certain other developmental outcomes in experimental and control classes in ninth grade English. Each pair of classes was taught by the same teacher who possessed basic information about one class but no systematically derived data for the other class.

Specifically, Dugan endeavored to answer the follow-questions.

1. Will teacher knowledge of individual differences for a particular class be increased through the use of systematic personnel records?

2. Will pupil achievement be improved as a result of teacher knowledge of certain basic pupil differences?

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[27]Willis E. Dugan, A Study of the Influence of Teacher Knowledge of Individual Pupil Characteristics Upon Achievement and Other Developmental Outcomes. Unpublished Doctor's Dissertation, University of Minnesota, 1942.

3. Will pupil participation in extra-classroom activities be affected by teacher knowledge of individual pupil characteristics?

4. Will the vocational choices of pupils be affected by teacher knowledge of individual interest and ambitions?

5. Will pupil attitudes in certain areas be affected as a result of teaching guided by a knowledge of pupil differences?

6. Will pupil-teacher relationships as judged by pupil ratings of the teacher be influenced by teacher knowledge of individual pupil characteristics?[28]

The experiment was conducted in 10 ninth grade English classes in five high schools in Minnesota during the school year 1941-1942. These 10 classes represented five pairs with one pair in each school taught by the same teacher. One class of each pair was designated as the experimental class and the other as the control class. The teachers of the experimental class were those who were provided with data regarding individual differences of their pupils.

A series of pre-tests and data forms were administered to the entire group of ten classes in September 1941. They were selected because they represented tests and inventories which provide data useful in describing certain characteristics of pupils and because they represented tests of the initial status of both experimental and control classes on areas that enhanced the measurement of change over a period of one year.

These basic areas of information included: scholastic aptitude, basic skills in reading, arithmetic and language,

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[28] Ibid., p. 63

personal history, interests and attitudes, home and family information, and reading acquaintance.

The final appraisal materials and post tests were secured from the teachers and the pupils. The post-tests given to pupils measured achievement in language skills and reading acquaintanceship, changes in relationships toward others, and educational and vocational plans. The information secured from teachers was in terms of scores on a test of teacher knowledge of certain pupil characteristics, and information regarding the teacher's reaction to the study.

In stating his findings the writer says that the null hypothesis that teacher knowledge of individual pupil characteristics is not increased through the use of systematic personnel records is refuted. Within the limitations of the study the investigator concluded that the use of pupil personnel records was more effective than casual observation in increasing teacher knowledge of pupil characteristics.

The null hypothesis most significant in Dugan's study of the literature is that of there being no difference in achievement of experimental and control group pupils when the teacher has knowledge of individual pupil characteristics. The evidence obtained in two areas on ninth grade English achievement was not sufficient to refute the null hypothesis.

In a concluding statement Dugan writes,

> It is reasonable to suggest that although improved pupil-teacher relationships may not significantly affect achievement within the period of a year, the cumulative effect upon achievement level of continuous, harmonious and understanding relationships between teachers

> and pupils facilitated through adequate pupil records which are intelligently used may become significant.[29]

Summary. In summarizing this review of the literature it is clear that educators are keenly aware of the importance of building wholesome teacher-pupil relationships. These relationships help to create the kind of classroom climate in which learning can best take place.

Of the cases cited in which students have been asked to list the qualities of best-liked teachers, their responses have been very similar. These children have indicated that they like a teacher who has an understanding of children and their problems. They have also expressed a desire for teachers to recognize them as individuals, which, perhaps, is the very basis for good teacher-pupil relationships.

It is interesting to note that in five of the research studies reviewed in this chapter, there have been significant gains made in achievement by pupils who have had teachers with insights into human growth and behavior. Other studies show that during the experimental period the pupils having the teachers with certain knowledge about human behavior exhibit no significant gains in achievement. No study reviewed indicated a loss in achievement when the pupils had teachers who had received education pertaining to child growth, development, and behavior.

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[29] Ibid., p. 152.

CHAPTER III

DESIGN OF THE STUDY AND EXPERIMENTAL PROCEDURES

This investigation was conducted in eighteen fifth grade classes in nine different white elementary schools in Baltimore, Maryland, during the school year 1948-1949. These eighteen classes represent nine pairs; one pair coming from each of the nine schools. One of the two classes in each school was designated as the experimental class and the other as the control class. The experimental class in each school-pair denotes the group for which the teacher had completed three years of the in-service program of child study as sponsored by the Institute for Child Study of the University of Maryland. The control class specifies the group taught by a teacher who had not participated in the child study program.

The schools of Baltimore were selected as the location of this study for a number of important reasons. The first of these reasons was that many of the teachers in the public schools of Baltimore had completed three years of the child study program, thereby making their pupils available as potential subjects for this study. A second important reason was the fact that the Bureau of Research of the Department of Education in Baltimore has for many years given standardized tests at the beginning of each school year. This systematic testing program provided the test results which were made available to the writer. A third reason for the selection of the schools of Baltimore was their proximity to the University of Maryland.

Three hundred twenty pupils were involved in the study; 160 pupils in the total experimental group and 160 pupils in the total control group took the pre-tests given in September, 1948. The same number of pupils in each of the groups took the post-tests given in September, 1949. It was possible to obtain these data because the pre-tests and post-tests had been administered prior to this investigation.

SELECTION OF SCHOOLS, PUPILS, AND TEACHERS

The selection of schools was determined by whether the schools had among its teachers two fifth grade teachers, one having completed three years of the in-service program of child study and the other who had not participated in the child study program. Herein, was the primary consideration in setting up the experimental and control classes. Another factor taken into consideration was the degree of geographical distribution the particular school contributed to the study. The latter factor was deemed important to a consideration of social class differences in pupil achievement. All of the schools were white elementary schools and contained kindergartens and grades one through six.

Fifth grade pupils were selected for study because it was felt that the influence of physical growth factors was minimized at this grade level. Consideration of sixth grade pupils would have involved using post-test data from the junior high school testing program. Since this testing program is quite different from that of the elementary schools sixth grade pupils were not included in the investigation.

The pupils in the experimental group were selected by first determining which fifth grade teachers had completed the child study program. The pupils in these teachers' classes were then traced back to the preceding years to be certain that they had been in classrooms of non-child study teachers. If they had not, they were withdrawn as possible pupils to be included in the study. An additional criterion for selection was that of including only those pupils who had been promoted with their class during the experimental period. This was necessary because of the different test forms used in each of the grades.

The pupils comprising the control group were selected by much the same method as that used for the experimental group, except that it was necessary for these pupils <u>not</u> to have had a child study teacher. To enhance comparability of the groups the same number of pupils was taken from the same grade of the same school for the same year. In so doing, it was felt that the pupils of the experimental and control groups had relatively the same educational facilities available to them, and came from the same general socio-economic groups.

The pupils of the control group were also equated with pupils of the experimental group in terms of intelligence quotients. When it was not possible to match exactly the intelligence quotients, a pupil was selected whose intelligence quotient was not more than three points higher nor lower than that of the pupil with whom he was being matched.

The primary consideration for the selection of teachers

has of necessity been presented in the discussion of selection of pupils. The two groups were selected on the following bases: the teachers in the experimental group had completed three years of the child study program, and the teachers in the control group had not participated in the child study program. A further control set up for all teachers was evidence of satisfactory teaching. This information was obtained from the personnel cards in the Bureau of Personnel of the Department of Education in Baltimore. From this same source the writer secured other pertinent information about the teachers of the experimental and control groups. These data are summarized in the following table.

TABLE 1

BACKGROUND INFORMATION ON
TEACHERS OF EXPERIMENTAL AND CONTROL GROUPS

ITEM	TEACHERS IN EXPERIMENTAL GROUP	TEACHERS IN CONTROL GROUP
Normal School Diplomas	7	6
Bachelor's Degrees	2	3
Average Years of Teaching Experience	22.1	20.2
Married Teachers	5	5
Single Teachers	4	4
Average Age	45.4	41.4
Median Age	47	41
Teachers' Efficiency Rating		
Moderate	1	1
Satisfactory	1	2

TABLE 1 (con't.)

BACKGROUND INFORMATION ON
TEACHERS OF EXPERIMENTAL AND CONTROL GROUPS

ITEM	TEACHERS IN EXPERIMENTAL GROUP	TEACHERS IN CONTROL GROUP
Good	2	3
Very Good	2	2
Excellent	3	1
Male Teachers	0	0
Female Teachers	9	9

A further analysis of the data pertaining to the teachers showed that all of the teachers in the experimental group had received their collegiate education in Maryland institutions. Seven of the teachers in the control group had received diplomas or bachelor's degrees from Maryland institutions, one had attended a state teachers college in Pennsylvania, and one had received a degree from a state college in California. None of the teachers in either group had received a master's degree.

Table 2 indicates the total number of teachers and pupils in each of the schools, and the number of teachers and pupils selected for study.

TABLE 2

TOTAL NUMBER OF PUPILS AND TEACHERS IN EACH OF THE PARTICIPATING SCHOOLS AND THE NUMBER SELECTED FOR STUDY

SCHOOL	PUPILS			TEACHERS		
	TOTAL IN SCHOOL	SELECTED FOR STUDY		TOTAL IN SCHOOL	SELECTED FOR STUDY	
		EXPERIMENTAL	CONTROL		EXPERIMENTAL	CONTROL
A	581	28	28	18	1	1
B	1004	17	17	28	1	1
C	910	10	11	24	1	1
D	889	16	16	25	1	1
E	855	23	23	21	1	1
F	625	22	22	15	1	1
G	762	5	5	25	1	1
H	797	13	12	18	1	1
I	871	26	26	20	1	1

EXPERIMENTAL PROCEDURES

A description of some of the experimental procedures involved in the study has been incorporated in the section of this chapter in which the selection of schools, pupils, and teachers was discussed. As has been stated, the pupils of the experimental and control groups were equated on the basis of intelligence quotients. Further controls were the selection of pupils for the experimental and control groups from the same grade level of the same school for the same year.

Achievement test score data from the Stanford Intermediate Achievement tests in reading and arithmetic were

secured. Kuhlmann-Anderson mental age and intelligence quotient data were obtained from the Teachers' Analysis sheets filed in the Bureau of Research of the Department of Education in Baltimore. Achievement test scores were also obtained from this source. The scores made on the achievement tests were recorded in terms of grade-points in order to facilitate analyses. Chi-square was used to determine comparability of the various groups on the pre-tests. These computations are presented in another section of this chapter. Chapter IV contains the tests for significance of the difference of experimental and control groups on the post-tests.

The data on individual attendance of pupils in the experimental and control groups were secured by examining the cumulative record cards in the schools involved in the study. Attendance data were obtained for the first and second terms of the school year 1948-1949.

In order to identify the social-class of each school-community four judges were selected. They were selected because of their wide knowledge of the school-communities and their sensitivity to factors determining social class. The judges used a modified form of the Index of Status Characteristics containing indices pertaining to occupation, source of income, education, religion, and ethnicity. Copies of the form and the directions for filling it in are included in Appendix A. One form was filled in by the principal and one teacher from each of the schools involved in the study. Another form was completed by the assistant director of secondary curriculum in Baltimore. This person conducts an in-service program of

community study and is sensitive to social class factors. A third form was filled in by the assistant director of elementary curriculum who also coordinates the child study program in Baltimore and recognizes social class differences. The fourth form was filled in cooperatively by the director of special services in Baltimore and the visiting teacher serving each of the participating schools.

The data pertaining to sub-cultural group affiliation were obtained also from the Index of Status Characteristics.

The schools' pupil records proved to be inadequate for purposes of securing the social class rating for each student involved in the study; therefore, the people mentioned above rated the school community as a whole on the various indices of status characteristics.

THE DATA AVAILABLE FOR ANALYSIS

The data obtained for all experimental and control group pupils participating in the study were recorded on basic data sheets in order to facilitate subsequent analyses. The basic data sheet is an 8½" x 11" mimeographed sheet with entries as indicated on the sample contained in Appendix B. On the face of the sheet space was provided for the name of the pupil. The remainder of the face of the sheet was divided into two large sections, each section representing one of the years for which achievement test results were secured. In each of the sections provision was made for entering the pupil's score made on the Stanford Intermediate Achievement tests in reading and arithmetic. The balance of the entries

in these sections were for chronological age, Kuhlmann-Anderson mental age and intelligence quotient, the identity of the school, the grade level of the child at the time the test was administered, and the date the tests were administered. Two principle entries were made on the reverse side of the data sheet. The attendance of the pupil for the first and second terms of the school year 1948-1949 was recorded along the bottom of the sheet. The right-hand half of the sheet was divided into five rows. In these rows were recorded the weighted sums assigned by the judges in evaluating occupation, source of income, education, religion, and ethnicity as a means of identifying social class. These latter data were transcribed from the modified form of the Index of Status Characteristics.

The data available for analysis are of two types. That regarding measurements of achievement in reading, arithmetic and intelligence in relation to social class, mental age, and I.Q. constitutes the data of the first type. Attendance figures for each pupil comprise data of the second type.

The specific hypotheses covering these two broad categories of data are presented in the last section of this chapter.

NATURE OF EXPERIMENTAL TEACHERS' CHILD STUDY EXPERIENCES

In Chapter I of this study a brief presentation was made of the history and some of the operational procedures of the child study program. A description was not made, however, of the basic purposes of each year-level of this type of

in-service teacher education program. Since the publication of the book Helping Teachers Understand Children, groups of teachers have modified and improved the procedures for learning the principles of human development through the direct study of children. From the experience of these teachers and consultants has evolved a three year program of child study containing procedures and experiences designed to give teachers insight into the causes of behavior.

Vital to carrying on an effective program of the direct study of children is the development of and adherence to a code of professional ethics on the part of all participants. This code was based upon a deep conviction of the value of all human beings and of the necessity for guarding the dignity, reputation, and self-respect of every human personality. In adhering to a code of professional ethics all participants agreed that they would not discuss information about children or their families outside of the study group. Further, they agreed to safeguard the materials and case record containing information about the child being studied. Without the safeguard of this code damage to a child or his family could result and the success and effectiveness of the whole program could be placed in jeopardy.

The composition of the child study groups varies considerably with the locality and the number of teachers enrolled in the program. Usually these groups are comprised of from six to twelve members. If any one school has sufficient numbers of teachers a study group is formed. If not, teachers from two or three schools combine to form a group. It is not

unusual to find teachers, administrators, and guidance counselors in one study group, each contributing his own unique point of view. Each group has a leader, usually chosen on the basis of previous experience in the field of human growth and development through participation in child study groups or workshop experience. These leaders are in no sense of the word "teachers". A more accurate description of their role would be that of "chairman". The method of selection of group leaders varies in each center. In keeping with democratic procedures it has been recommended that each group select its own leader. In some centers this plan was followed while in others leaders were selected by the local coordinator, supervisors, or administrators.

The workshops for leaders have been of two general types. The first of these is the local type of workshop organized by school systems for the professional development of the teachers in the particular school system. Resource people from centers in child study, such as the Committee on Human Development of the University of Chicago and the Institute for Child Study of the University of Maryland, have staffed these workshops in the past. The second type of workshop is that set up for study group leaders and coordinators of the various child study centers over the country. Typical of the latter are the six or nine-week workshops held during the summer at the University of Maryland and the University of Chicago.

Three times during each year the child study groups are visited by a consultant from the Institute for Child Study of the University of Maryland. The purpose of the consultants'

visits is to act as a resource person, to aid in solution of problems confronting the group, and to suggest further steps and procedures.

The philosophy of this program of the direct study of children is revealed in the basic assumptions which underlie the program. They are:

1. The learning and behavior of the child and his development through time are caused.

2. The causes of behavior are multiple, complex, and interrelated.

3. Every human being is inherently valuable and potentially can make some contribution to carrying on the society into which he is born.

4. Every child is unique. The constellation of factors that is operative for each child is therefore unique and changes through time for him.

5. A child is an indivisible unity; he cannot be taken apart and understood in terms of separate processes.

6. The normal processes of growth and development give rise naturally to a series of developmental tasks for each child which are related in their onset and character to the child's physical maturity level rather than to his chronological age.

7. Most children face a number of adjustment problems that complicate the accomplishment of developmental tasks and traditional school learnings.

8. Valid interpretations of behavior using the scientific method are possible only when objective factual information is the basis for the analysis and initial conclusions

remain tentative subject to modification in the light of additional valid evidence.[30]

The specific objectives of the first year are: (1) To achieve an understanding and acceptance of the basic assumptions underlying the program; (2) development of skills and techniques in gathering information about a child including the ability to observe and describe the behavior of a child objectively; (3) to gain an understanding that a child's growth, behavior, and development are the result of processes operating through time; and (4) to produce changes in teachers' attitudes toward children which result in their viewing classroom behavior through the eyes of children instead of through the eyes of a middle class adult.

Another basic purpose is that of applying the experimental attitude and method as the most effective way of realizing our democratic ideals. This involves the use of the following basic steps in scientific procedure:

1. Collecting valid data by developing skill in recording extensive, objective information about individuals, through observing their behavior.

2. Learning to interpret behavior by relating hypotheses about an individual to an appropriate and inclusive framework of validated generalizations about human behavior and development. This is done by:

(a) Preliminary interpretation of available data by suggesting tentative and multiple hypotheses to

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[30]Daniel A. Prescott, "Communicating Knowledge of Children to Teachers." op. cit., pp. 20-22

explain the observed behavior of an individual in the light of known principles of human development and behavior.

(b) Re-checking hypotheses against evidence in order to discover where more information is needed to substantiate, modify or reject suggested explanations.

(c) Generalization and implication by establishing an individual's basic patterns of behavior through discovering the significant personal trends which reflect the individual's successes and unsolved tasks.

The First Year of the Program. During the first year of the child study program the teacher selects a child who does not present himself as a behavior problem. The teacher then gathers data about the child using all available sources known to her. As a rule these data are collected from the following sources:

1. School records - special tests, guidance and psychological services.

2. Home visits and contacts with the child's family.

3. Information from other people's observations, such as other teachers, the school nurse, and the guidance counselor.

4. Anecdotal observations of the child in as many different situations as possible, and over as long a period of time as possible.

5. The child's freely creative products, such as written compositions, paintings, and crafts products.

6. An analysis of the child's life-space.

Considerable emphasis is placed upon the writing of anecdotal descriptions of overt behavior as one of the most important sources of information. Much time is devoted to learning to write anecdotes that are non-generalized, non-evaluative, and non-interpretive. The teachers learn to make specific descriptions in their anecdotes, involving: (1) a setting for each behavioral incident in terms of the date, time of day, and previous happenings; (2) the emotional flavor of each incident, such as facial expressions, posture, gestures, and direct quotation of conversation when possible; and (3) a variety of incidents such as seeing the child at play, at work, in the home, and in inter-relations with other people.

As time goes on the teacher reviews the recorded information about the child, endeavoring to discover characteristic commonalities or patterns of behavior and situations which recur. These show a related sequence because they stem from the organization of the child's personality. The recurring patterns are studied and recognized as types of learning processes the child is working on. Hypotheses are then formulated to explain these recurring patterns of behavior and a critical check of the hypotheses is made against the evidence included in the record of the child. An analysis of the record is made to answer these questions:

1. What is this child working on?
2. What is the child up against?

The Second Year of the Program. In many ways the teachers' experiences in the second year of the child study program parallel those of the first year. The teacher again selects a child to study and collects as much information about the child as possible. The data are obtained from the sources available to the teacher; usually those as presented in the description of the first year experiences.

The unique feature of the second year is that an analysis of behavior is made using an organizing framework. This organizing framework is in terms of six major areas of processes influencing any individual's growth, behavior, and development. The organization of information and ideas provides an effective scheme for understanding and remembering scientific concepts, for checking the completeness and scope of the record, and for seeing what scientific information applies toward understanding particular incidents in the record. Briefly stated, these six kinds of processes are as follows:

1. Physical or Organic Processes. The organization of energy and the dynamic nature of human life. Conditions affecting the efficiency of living and growing human organisms; the normal variations and patterns of human growth and human inheritance.

2. Affectional relationships and processes. The manner in which people provide or withhold affection, and the influence of the climate of affection surrounding a person during development.

3. Peer group processes. Finding and maintaining a

suitable place among age mates and the importance of peer group belonging on learning and development.

4. Socialization processes. The expectations and pressures under which an individual develops, resulting from the pattern of life which the various sub-cultures force onto the community, the school, and the family. The nature and importance of social heredity and the way it is transmitted to successive generations.

5. Self-developmental processes. The development within the individual of skills, concepts, attitudes, values, and goals, and their part in determining an individual's behavior.

6. Self-adjustive processes. The development within the individual of characteristic ways of meeting emotional situations which enable him to defend, reassure, and comfort himself.

All of the data gathered by the teacher are classified into one or several of the six areas listed above. The information in these areas is carefully scrutinized and hypotheses formulated about the causes of behavior in each of the areas. These hypotheses are then critically checked against the evidence in the record. The analysis is completed by answering two questions:

1. What developmental tasks is the child working on?

2. What adjustment problems is the child facing?

The use of the six-area organizing framework gradually leads the teacher to realize that conditions and processes taking place in an individual are inseparably interrelated,

and that the six-area framework is actually an artificial compartmentalization necessary because the human mind cannot keep the complexity of the whole in conscious focus at any one time.

During the course of the year teachers become aware of the need for reading because they lack understanding of what the particular child is trying to do through his behavior. As the need presents itself participants do reading related to each of the six areas so that validated scientific concepts explaining human growth, development, and behavior may be broadened and deepened. These insights are then drawn upon to interpret the behavior of the child being studied.

The Third Year of the Program. The experiences of the third year center upon a fuller understanding of the self-developmental and self-adjustive processes, permitting deeper insights into a child's motivation, behavior, and development. This is also achieved by interrelating the facts and generalizations of the different areas so as to produce a clearer understanding of the behavior and development of the whole child. The same six-area framework is used as in the second year to analyze the data on each child selected for study. Additional experiences in third year include studying the child as the member of a group and analysis of peer group dynamics in the classroom through collecting sociometric data, making and analyzing sociograms, and relating those findings to data on peer group processes contained in the case record. The analysis of the case record often reveals areas wherein the child needs help. Planning, carrying out, and evaluating ways of helping the child are additional experiences which

teachers in the third year of the program may have. The interpretation of the case record consists of a more meaningful analysis and interrelating of the processes of the six areas, analysis of the sociogram, summary and evaluation of the things which the teacher did in trying to help the child, and drawing out and identifying from the findings the child's developmental tasks and adjustment problems.

During the entire year the teacher does wide reading in the area of psychological development. The reading includes exploration of the various schools of thought in the psychology of personality development and adjustment.

DESCRIPTION OF TESTS AND FORMS USED IN THE STUDY

The reading tests used in this study were the Stanford Reading Achievement Tests, Intermediate Series, Forms D-Partial and H-Partial.

The arithmetic tests used were the Stanford Arithmetic Achievement Test, Intermediate Series, Forms D-Partial, and H-Partial.

The intelligence tests employed were the Kuhlmann-Anderson Tests, Revised, Fifth Edition, Grades V, and VI.

Achievement Tests Used. The Stanford Arithmetic Achievement Tests, Intermediate Series, Forms D-Partial, and H-Partial, consist of two parts or sub-tests.

Test 1. Arithmetic Computation.

In this test the pupil is presented with problems of many kinds involving a knowledge of all of the fundamental techniques. The total number of sixty-two items also includes

work with decimals, fractions, graphs, areas, volumes and averages. The pupil is given multiple choice from which to select his answer. Time allotment, forty minutes.

Test 2. Arithmetic Reasoning.

This test is made up of forty word problems designed to test the pupil's knowledge of the technique to be employed in deriving the correct answer. No actual computation is required. The problems include work with fractions, decimals, and volumes. Time allotment, twenty minutes.

Forms D-Partial and H-Partial of the Stanford Reading Achievement Tests, Intermediate Series, also consist of two parts or sub-tests.

Test 1. Paragraph Meaning.

This test undertakes to measure the pupil's ability to select the central topic of a paragraph and his ability to identify details essential to the meaning of the paragraph. Eighteen paragraphs are included for analysis as stated above. Time allotment, twenty minutes.

Test 2. Word Meaning.

The fifty items in this multiple choice type of test are designed to test the pupil's understanding of words drawn from the broadly defined subject areas of social studies, science, mathematics, and English. Time allotment, ten minutes.

Intelligence Tests Used. The Revised Fifth Edition of the Kuhlmann-Anderson Intelligence Test consists of a group of nine sub-tests for any one grade. The tests for grades V and VI include sub-tests nineteen to thirty-one inclusive of the Kuhlmann-Anderson battery.

Test 19.

The numbers one through nine are placed at the top of the test sheet, with a letter of the alphabet directly under each number. There are twelve examples in which sets of numbers are given. Each of these sets of numbers represents a word. The pupil writes the word for each set of numbers. Time allotment, two minutes.

Test 20.

In this test eleven pairs of figures are given, one figure of each pair being incomplete. The person taking the test is required to complete the second figure of each pair making it exactly like the first. Time allotment, three minutes.

Test 21.

The pupil is given two minutes to do fifteen examples on this test. Each example consists of five words, four of which are similar in some respect. The word that does not belong with the others is to be underlined.

Test 22.

Two minutes are given to complete the fifteen examples in this test. Each example consists of a given word, which is usually a noun, and five other words, one of which describes the nature of the given word. The pupil is to underline the proper descriptive word.

Test 23.

The examples in this test consist of six words, two of which are the opposite of each other. The pupil is to underline the words that are the opposite of each other. Ninety seconds are given for the fifteen examples.

Test 24.

The word "demonstrable" is spelled across the top of the page. Under it are forty-five four letter words. The pupil is asked to draw a line through each word which cannot be derived from the letters in the word "demonstrable". Time allotment, three minutes.

Test 25.

In each of fifteen examples the student is presented with a given word (usually a noun), which is followed by a list of five other words. In each list the examinee is to underline the two things that the given word is never without. Time allotment, two minutes.

Test 26.

A list of six words is given in each of fifteen examples. It is required to underline the three words in each example which are alike in some respect. Time allotment, two minutes.

Test 27.

The test consists of twelve sentences in which the pupil is to write the letter or word needed to finish the sentence correctly. An example of this would be, "The third letter before M is . . . ." Time allotment, two minutes.

Test 28.

This test consists of fifteen examples, each of which contains letters which do not spell a word as they are given. One of these letters stands apart, and the pupil is to make a word out of the letters by changing them around. The word is to start with the letter that stands apart from the others.

Time allotment, two minutes.

Test 29.

In this test each of fifteen examples contains four words, three of which have a common letter. The pupil is asked to underscore the word not having the common letter. Time allotment, three minutes.

Test 30.

This test consists of fifteen sentences in which the words are arranged so that the sentence is meaningless. Pupils are given three minutes to draw a line under the words which would be first and last if they were changed around to make a good sentence.

Test 31.

This sub-test includes fifteen rows of numbers, six to each row. In each row, the numbers count up or down with an equal number between each except for one number which breaks the sequence. Pupils are asked to cross out the misplaced number in a time limit of two minutes.

Form Used for Identifying Social Class Groups. The instrument used in this investigation for the identification of social class was a modified form of the Index of Status Characteristics. This form was developed by Warner and his associates and later modified by Loeb and McQuire. Originally the Index of Status Characteristics was designed to be used in connection with an interview technique for the determination of social class called Evaluated Participation. Since this thesis is not a major community study only the former technique was employed. The various indices are designed to

estimate social class status. The following indices were used.

a. Occupation[31]

b. Source of Income[31]

c. Education[32]

d. Religion[32]

e. Ethnicity[32]

This index is the weighted sum of the school communities' scores on five seven-point rating scales designed to evaluate, respectively, occupation, source of income, education, religion, and ethnicity. A copy of the form used in this study may be found in Appendix A.

Validity of Tests and Forms. Validity may be defined as an expression of the degree to which a test measures the qualities, abilities, and skills which it is designed to measure. Validity may be expressed statistically in terms of the correlation of the test with certain outside criteria. It may also be expressed in terms of the extent to which the test sets up situations calling into play the skills or abilities which experienced observers consider fundamental to success in the given field.

Since no direct statement is made of the method used for validating the Stanford Achievement Tests, the method of

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[31]W. Lloyd Warner, Marchia Meeker, and Kenneth Eells, Social Class in America. Chicago: Science Research Associates, Inc., 1949.

[32]Carson McQuire, Social Status, Peer Status, and Social Mobility. Mimeographed Memorandum for Research Workers, Chicago: University of Chicago, 1949.

standardization is perhaps the best assurance of the validity of these tests.[33]

The normative population included one hundred seventy-three communities, involving 300,000 pupils, drawn from thirty-two states. In each of the communities, the least amount of consecutive grades tested was three. All grades from two through nine were tested in seventy of the communities.

When the tests were given, all of the booklets were numbered and a record kept of numbers assigned to each grade in the various communities. After the scoring of the tests, a list of serial numbers was selected from a table of random numbers and sent to the communities indicating that these test booklets were to be used for further analysis. These papers, the authors claim, represented a random sample of twenty per cent of the normative population. The minimum number of cases per grade for any community was fifty. The total number of cases in the random sample was 50,955.

The customary methods for determining the validity of tests have not been employed in connection with the Kuhlmann-Anderson tests. The authors contend that:

> We cannot determine the validity of mental tests from their correlation with other criteria whose validity is assumed instead of known .... Conditions can and frequently do exist wherein such correlations are high because both tests are poor through having the same fault that naturally leads to the same scores on both.
>
> In the present tests, chronological age is used as the criterion of what the tests propose

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[33] Oscar K. Buros, The Third Mental Measurements Yearbook. New Brunswick, N. J.: Rutgers University Press, 1949, p. 534.

> to measure. We propose to measure mental development from the age of five to maturity. For this purpose that test is most valid which shows this development best, by having the highest rate of increase in score through successive years. This trait has been called the discriminative capacity of the tests, or the ability to make fine discrimination between small increments in mental development. The thirty-nine tests included in the nine batteries of the scale were selected from over a hundred tried out, because, with few exceptions, they gave the largest and most consistent increase in score for the successive age levels. The exceptions were determined by such consideration as ease of administration, of scoring, and possibility of being influenced by coaching and special training.[34]

Warner and his associates present no technical discussion of the validity (or reliability) of the Index of Status Characteristics. Indirect references are made to reliability by presenting inter-correlations between the Index of Status Characteristics and another technique designed to predict social class called "Evaluated Participation".

McQuire, however, makes the following statement when discussing the Index of Status Characteristics, "It should be emphasized that the predicted 'social class' status, while being 'reliable' and 'valid' in the study of populations, may be wrong in particular cases."[35]

Reliability of Tests and Forms. The reliability of a test expresses the consistency with which it measures whatever qualities it is designed to measure. In general, a test

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[34]F. Kuhlmann, and Rose Anderson, Kuhlmann-Anderson Intelligence Tests, Instruction Manual, Educational Test Bureau, Philadelphia, 1940, pp. 6-9.

[35]Carson McQuire, Social Status, Peer Status, and Social Mobility. op. cit., p. 9.

must sample carefully and extensively in the field which it measures in order to secure reliable results.

The reliability of a test is ordinarily measured in two ways: first, by correlating the scores on one form of a test with scores on a successive administration of an alternate form of the test; or secondly, by correlating the scores on the odd-numbered items of a test with scores on the even-numbered items of the test and correcting the resulting coefficient by application of the Spearman-Brown formula to yield an estimate of the reliability of the whole test rather than of half of the test.

The authors of the Stanford Achievement tests calculated reliability coefficients from odd and even numbered test items. Their reliability coefficients were derived by using the Spearman-Brown formula, which for Grade V are summarized in Table 3.

TABLE 3

RELIABILITY DATA FOR STANFORD ACHIEVEMENT TEST[36]

Test	r_{11} (corrected)	PE_m
Grade 5 (Intermediate) Paragraph Meaning	.936	1.87
Word Meaning	.907	2.06
Arith. Reasoning	.870	2.62
Arith. Computation	.913	1.78

[36]T. L. Kelley, Giles Ruch and Lewis Terman, Stanford Achievement Test. Directions for Administering, New York: World Book Co., 1940, p. 10.

The authors of the Kuhlmann-Anderson tests have not used the commonly accepted methods for determining reliability. They state that tests which show the highest coefficients of correlation may be poor tests, and that the capacity to discriminate may be decreased in an effort to develop tests which will show a high coefficient of correlation. They emphasize the necessity for securing the right degree of difficulty for the mental level of each test as requisite of a most valuable and fundamental nature. They maintain that the:

> Right degree of difficulty tends to uniform effort on the part of the child, and this tends to give high coefficients of reliability. In this case, the high correlation would be evidence of the test's being good. But high correlations also result when the tests are either too easy or too difficult, because all scores tend to be the same . . . . We have attempted to make the tests reliable by adjusting the difficulty of the tests used at each age to the mental development found there.[37]

ADMINISTRATION, SCORING, AND TABULATION OF TESTS

All of the tests were administered as a part of the city-wide testing program conducted by the Department of Education of Baltimore, Maryland. In each of the schools involved, the school principal administered the tests. Presumably, each of these principals followed the directions for administration of the tests as prescribed in the test manuals. Since the principal administered the tests to both the experimental and control groups, uniformity of test administration was obtained. All of the tests were administered in the regular classrooms.

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[37]F. Kulhmann and Rose Anderson, op. cit., p. 9.

Tests were administered on the following dates:

Stanford Intermediate Reading	Kuhlmann-Anderson Intelligence	Stanford Intermediate Arithmetic
Form D-Partial September 1948	Grade V September 1948	Form D-Partial September 1948
Form H-Partial September 1949	Grade VI September 1949	Form H-Partial September 1949

Scoring of the tests was done by machine at the Bureau of Research of the Department of Education in Baltimore. The tests were then returned to the various schools where the teachers tabulated the results using the Teachers' Analysis Sheet. It was from these sheets that the test results data were obtained.

STATISTICAL METHODS EMPLOYED

The design of the experiment places the major burden of analysis of achievement data upon the statistic chi-square. Analyses of achievement scores are made in terms of the differences in scores for the experimental and control groups.

Exclusive use is made of chi-square in testing certain hypotheses related to total experimental and control group achievement in reading and arithmetic achievement and changes in intelligence quotient; social class differences in achievement, and other factors for which such a treatment is appropriate. Lindquist states that:

> The statistic x^2 (chi-square) may be defined as $x^2 = \sum \frac{(f_o - f_t)^2}{f_t}$ in which f_o represents the observed frequency in a single category, f_t the corresponding theoretical frequency, and in

which Σ indicates that the terms $(f_o-f_t)^2/f_t$ are to be summed for all categories.[38]

A class of tests in which chi-square is employed consists of tests of independence; i.e., tests of the hypothesis that two variables or factors are unrelated. Chi-square is also employed to test the "goodness of fit" of frequency distributions which is particularly applicable to this study. In the application of the statistic chi-square to the present study, the hypotheses are set up in terms that there is no relationship between the group, experimental or control, to which a pupil belongs and performance on certain measures. Such tests of the independence of experimental and control groups are applicable to contingency tables of various sizes, regardless of the number of columns. The complete tables indicating the frequencies involved in all treatments utilizing the chi-square test are included in Appendices C and D. The value of chi-square obtained and the appropriate table values for this statistic for varying degrees of freedom are presented in the text of the thesis.

In this study there are fifty-six distinct problems in which the statistic chi-square is utilized.

TESTING THE COMPARABILITY OF GROUPS

An initial problem involved in the analysis of the data was to determine whether the total experimental group and control groups were equivalent. One of the controls exercised

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[38]E. F. Lindquist, Statistical Analysis in Educational Research. Boston: Houghton Mifflin Co., 1940. p. 31.

in this study was to equate pupils of the experimental and control groups on the basis of intelligence quotients. The test for equivalence, or comparability, was effected by plotting a frequency distribution for each of the groups and then comparing the frequency distributions for "goodness of fit" by utilizing the statistic chi-square. This procedure was used also for testing the comparability of social class groups, sub-cultural groups, and intelligence quotient groups.

Comparability of Total Experimental and Control Groups. To test the comparability of the entire experimental and control groups in intelligence, the frequency distributions presented in Appendix C were plotted. From these frequency distributions a contingency table was derived and the statistic chi-square applied to it as a test of comparability. This contingency table is included also in Appendix C. The probability level obtained from the application of this statistic was .30 which would indicate that the difference between these two groups is not statistically significant, and that for purposes of this study the groups were equated in terms of intelligence quotients.

In order to note significant changes in level of achievement during the experimental period it was necessary to determine whether the total experimental and control groups were comparable in levels of reading and arithmetic achievement at the beginning of the experiment. It will be remembered, however, that no attempt was made to equate them on these bases. The scores made by pupils, in terms of grade-points, were plotted on a frequency distribution and contingency tables

made from it. The statistic chi-square was employed to determine independence or equivalence of the groups. The frequency distributions for scores made by the total experimental and control groups in reading achievement and arithmetic achievement are shown on pages 141 and 143, respectively. The level of probability obtained from the application of chi-square to the distributions of reading achievement scores proved to be .30, which shows that there is no significant difference between the two groups. The same statistic applied to the distributions of arithmetic achievement scores yielded a probability level of .20, indicating no significant difference in arithmetic achievement.

For purposes of clarification the statistical findings pertaining to similarity of the total experimental and control groups in regard to intelligence quotients, reading achievement, and arithmetic achievement are presented below in tabular form.

TABLE 4

PROBABILITY LEVELS OBTAINED BY COMPARING TOTAL EXPERIMENTAL AND CONTROL GROUPS ON PRE-TESTS IN INTELLIGENCE, READING ACHIEVEMENT AND ARITHMETIC ACHIEVEMENT

	CHI-SQUARE	d.f.	PROBABILITY LEVEL
INTELLIGENCE QUOTIENTS	7.14	6	>.30
READING ACHIEVEMENT	8.96	8	>.30
ARITHMETIC ACHIEVEMENT	9.14	7	>.20

Comparability of Social Class Groups. Before the application of statistical procedures to determine the comparability of the various social class groups as to intelligence

quotients and reading and arithmetic achievement, it was necessary to determine the social class of the schools involved in this study. This was accomplished by analyzing the valuations made by the four judges on the modified form of the Index of Status Characteristics previously described in this chapter. The social class ratings of the schools as determined by the respondents' valuations show that one school was rated as being in an upper-middle class community, three schools were in a lower-middle class community, four schools were situated in an upper-lower class community, and one school was in a lower-lower class community. Appendix A contains a more detailed description of the determination of social class standing for each of the school-communities.

The same procedure was followed throughout this study in determining the equivalence of groups as has been described above in connection with comparing the total experimental and control groups. This procedure was to make frequency distributions of the various achievements being considered, derive contingency tables from the frequency distributions, and then apply the statistic chi-square. The statistical findings pertaining to comparability of the experimental and control groups in each of the various social classes is presented in Table 5. The frequency distributions for each of these comparisons may be found in Appendix C.

TABLE 5

PROBABILITY LEVELS OBTAINED BY COMPARING EXPERIMENTAL AND CONTROL GROUPS OF THE VARIOUS SOCIAL CLASSES ON PRE-TESTS IN INTELLIGENCE, READING ACHIEVEMENT, AND ARITHMETIC ACHIEVEMENT

	CHI-SQUARE	d.f.	PROBABILITY LEVEL
UPPER-MIDDLE CLASS			
INTELLIGENCE QUOTIENTS	3.63	5	>.50
READING ACHIEVEMENT	6.16	3	>.10
ARITHMETIC ACHIEVEMENT	0.42	2	>.80
LOWER-MIDDLE CLASS			
INTELLIGENCE QUOTIENTS	8.38	5	>.10
READING ACHIEVEMENT	10.96	7	>.10
ARITHMETIC ACHIEVEMENT	14.34	6	>.02
UPPER-LOWER CLASS			
INTELLIGENCE QUOTIENTS	7.25	4	>.10
READING ACHIEVEMENT	7.18	5	>.20
ARITHMETIC ACHIEVEMENT	4.22	2	>.10
LOWER-LOWER CLASS			
INTELLIGENCE QUOTIENTS	5.50	5	>.30
READING ACHIEVEMENT	2.50	5	>.70
ARITHMETIC ACHIEVEMENT	1.56	3	>.50

These findings show that in all but one of the comparisons made between the experimental and control groups pertaining to social class and achievement, there is comparability of the groups. The exception was in comparing the experimental and control group of the lower-middle class in arithmetic achievement. In this instance there was statistical significance at the two per cent level which indicates that the groups were not similar.

Comparability of Sub-Cultural Groups. The determination of sub-cultural affiliation was made on the basis of valuations by four judges on the modified form of the Index of Status

Characteristics. The ratings of the schools as determined by the respondents' valuations show that School H was rated as having a Polish ethnic group in the community. The only other sub-culture identified by the judges was the Jewish religious group from School F.

Another consideration in this study was to ascertain the comparability of the various sub-cultural groups in each of the experimental and control groups as regards intelligence quotients, reading achievement, and arithmetic achievement. Here, again, the procedure was to plot frequency distributions, obtain from these distributions contingency tables, and then apply the statistic chi-square. The frequency distributions for each of these analyses can be found on pages 169 through 179. The results of these comparisons are presented in the following table.

TABLE 6

PROBABILITY LEVELS OBTAINED BY COMPARING EXPERIMENTAL AND CONTROL GROUPS OF SELECTED SUB-CULTURAL GROUPS ON PRE-TESTS IN INTELLIGENCE, READING ACHIEVEMENT, AND ARITHMETIC ACHIEVEMENT

	CHI-SQUARE	d.f.	PROBABILITY LEVEL
JEWISH RELIGIOUS GROUP			
INTELLIGENCE QUOTIENTS	1.28	4	>.80
READING ACHIEVEMENT	3.50	7	>.80
ARITHMETIC ACHIEVEMENT	1.86	3	>.50
POLISH ETHNIC GROUP			
INTELLIGENCE QUOTIENTS	2.40	5	>.70
READING ACHIEVEMENT	2.98	5	>.70
ARITHMETIC ACHIEVEMENT	1.98	3	>.50

These data show that the Jewish religious group is comparable in terms of intelligence quotients. This is to be expected since the experimental and control groups were equated on the basis of intelligence quotients. In terms of reading achievement and arithmetic achievement the experimental and control groups of the Jewish religious group are also comparable as revealed by the level of probability obtained. An inspection of the data in the above table reveals that the experimental and control groups of the Polish ethnic group are comparable in the qualities under consideration.

Comparability of Intelligence Quotient Groups. A further consideration in the analysis of the data was to determine the equivalence of the various intelligence quotient groups in each of the experimental and control groups. The same procedure was used to determine comparability as has been described previously in connection with other factors. In this instance it was unnecessary to test for comparability of intelligence quotients since the means of grouping was according to intelligence quotients. The frequency distributions for each of the comparisons are included in Appendix C. The statistical findings of these comparisons are presented in Table 7.

TABLE 7

PROBABILITY LEVELS OBTAINED BY COMPARING EXPERIMENTAL AND CONTROL GROUPS OF THE VARIOUS INTELLIGENCE QUOTIENT GROUPS ON PRE-TESTS IN READING ACHIEVEMENT AND ARITHMETIC ACHIEVEMENT

	CHI-SQUARE	d.f.	PROBABILITY LEVEL
70-89 I.Q. GROUP			
READING ACHIEVEMENT	7.69	4	>.10
ARITHMETIC ACHIEVEMENT	10.15	4	>.02
90-109 I.Q. GROUP			
READING ACHIEVEMENT	5.85	7	>.50
ARITHMETIC ACHIEVEMENT	7.99	6	>.30
I.Q.'s 110 AND OVER			
READING ACHIEVEMENT	10.37	7	>.10
ARITHMETIC ACHIEVEMENT	9.84	7	>.10

Examination of the data presented above brings to light the fact that all groups are comparable in all factors except the 70-89 I.Q. group in terms of arithmetic achievement.

Achievement Levels as Determined by Mental Age. A final point to be considered in this section is that of determining the number of pupils in each of the experimental and control groups who were achieving at grade expectancy, above grade expectancy and below grade expectancy. As has been pointed out in a previous section of this study, grade expectancy was ascertained from the pupils' mental age as revealed by a standardized group intelligence test. No attempt was made to equate pupils on the basis of mental age, therefore no comparability of the experimental and control groups could be expected. This presentation will be in terms of analyzing the number of

pupils at grade expectancy, below grade expectancy, and above grade expectancy at the beginning of the experimental period. The results of this analysis are presented below in Table 8.

TABLE 8

LEVEL OF PUPILS' ACHIEVEMENT AS DETERMINED BY MENTAL AGE, OF EXPERIMENTAL AND CONTROL GROUPS AT BEGINNING OF EXPERIMENTAL PERIOD

	EXPERIMENTAL GROUP		CONTROL GROUP	
	READING	ARITHMETIC	READING	ARITHMETIC
AT GRADE EXPECTANCY	46	40	26	39
ABOVE GRADE EXPECTANCY	59	38	76	36
BELOW GRADE EXPECTANCY	55	82	58	85
TOTAL	160	160	160	160

TERMINOLOGY USED IN THE STUDY

The key words and terms used in this study are defined as follows:

1. Child Study teacher: A teacher who has had three years of study in child development. This study had been that of the direct observation type as practiced in the field program of child study sponsored by the Institute for Child Study of the University of Maryland. (A detailed description of the field program in child study is given in another section of this chapter.)

2. Non-child study teacher: A teacher who has not taken part in the field program in child study sponsored by the Institute for Child Study of the University of Maryland.

3. Mental age: Mental age as applied to this study is limited to that phase of mental ability which can presumably be measured by group "intelligence" tests and is indicated by test results.

4. Experimental group: The experimental group specifies the group for which the teachers had completed three years of the field program in child study as carried on by the Institute for Child Study of the University of Maryland.

5. Control group: The control group specifies the group for which the teachers had not participated in the field program of child study as carried on by the Institute for Child Study of the University of Maryland.

6. Experimental period: The experimental period denotes the school year 1948-1949, during which time the experimental group was taught by child study teachers.

SUMMARY OF HYPOTHESES

In order to clarify the main points of the study, a summary of the specific hypotheses in this investigation are presented here. These main hypotheses are stated in null form and a designation of the statistical technique utilized in testing each hypothesis is indicated.

1. There is no difference between experimental and control groups in reading and arithmetic achievement, of pupils in the 70-89 I.Q. group, pupils in the 90-109 I.Q. group, or pupils having I.Q.'s over 110, resulting from teacher participation in the child study program. (Contingency tables derived from frequency distributions and chi-square.)

2. There is no difference between experimental and control groups in reading and arithmetic achievement or changes in I.Q. of pupils from selected sub-cultural groups because of teacher participation in the child study program. (Contingency tables derived from frequency distributions and chi-square.)

3. There is no difference between experimental and control groups in reading and arithmetic achievement, or changes in the I.Q. of pupils from the various social classes resulting from teacher participation in the child study program. (Contingency tables derived from frequency distributions and chi-square.)

4. The child study teachers have not affected the level of experimental group achievement (as determined by mental age) in reading and arithmetic any more than the non-child study teachers have affected the level of control group achievement. (Contingency tables and chi-square.)

5. There is no difference in the attendance of experimental and control pupils during the experimental period. (Contingency tables and chi-square.)

The next chapter will present the results of the analyses bearing on these five hypotheses.

CHAPTER IV

RESULTS OF THE INVESTIGATION

The detailed results of the investigation described in the preceding chapter are presented in this chapter while conclusions and interpretations of the experimental results are presented in Chapter V. Detailed presentations of the basic data from which the chi-square statistic is computed for certain information are given in Appendix D. In this chapter, the writer will present summary results for the various tests of significance with the appropriate levels of probability for each. Because the complete details of most analyses are contained in Appendix D, it was not considered necessary to duplicate them in this chapter. Only the results that are necessary for an accurate interpretation of the investigation are presented here.

The results are presented in terms of five areas. The five areas correspond to the five aspects of the study as outlined at the conclusion of Chapter I and in the null hypotheses summarized in Chapter III.

RESULTS PERTAINING TO ACHIEVEMENT OF PUPILS IN THE VARIOUS INTELLIGENCE QUOTIENT GROUPS

The procedure followed in determining whether pupils in the experimental group had achieved at a different rate than the pupils of the control group was identical to that used in testing the comparability of the groups using scores made on the pre-tests. In this instance, the scores made by pupils

on the post-tests were plotted on frequency distributions, and contingency tables derived from the distributions. The statistic chi-square was applied to the contingency tables as a test of independence of the groups. This procedure was used throughout the study in comparing the achievement of all groups.

In comparing the achievement test scores of pupils from the various intelligence quotient groups, frequency distributions were plotted for all pupils in the 70-89 I.Q. group, 90-109 I.Q. group, and those pupils having intelligence quotients over 110. The results of these comparisons will be considered in the order in which they are stated above.

70-89 I.Q. Group. The frequency distributions for the 70-89 I.Q. group, of the experimental and control groups, in terms of scores made on post-tests in reading and arithmetic achievement, are presented in Appendix D. The application of chi-square to the contingency tables obtained from the distributions gave a probability level of greater than .20 in reading achievement. This level of probability indicates that any difference between the experimental and control pupils in reading achievement can be explained on the basis of chance alone and is not due to causal factors. The same statistical test applied to arithmetic achievement scores made on the post-test yielded a probability level that was greater than .20. This, also, would indicate that differences in the experimental and control groups may be attributed to chance. Since the experimental and control groups were not comparable at the outset of the experimental period in arithmetic achievement, no consideration can be given to the change that has

taken place. For purposes of clarification the values of chi-square obtained and the appropriate table values for varying degrees of freedom are presented below for each of the testing periods in reading and arithmetic achievement.

TABLE 9

PROBABILITY LEVELS OBTAINED BY COMPARING EXPERIMENTAL AND CONTROL GROUPS OF THE 70-89 I.Q. GROUP ON PRE-TESTS AND POST-TESTS IN READING ACHIEVEMENT AND ARITHMETIC ACHIEVEMENT

	READING		ARITHMETIC	
	1948	1949	1948	1949
CHI-SQUARE	7.69	6.18	10.15	5.41
DEGREES FREEDOM	4	5	4	4
PROBABILITY LEVEL	>.10	>.20	>.02*	>.20

* Statistical Significance

90-109 I.Q. Group. The pupils of the experimental and control groups having intelligence quotients between 90 and 109 showed comparable levels of achievement in reading and arithmetic at the beginning of the experimental period. These data are given in the preceding chapter. The scores made by these same pupils on the post-tests in reading and arithmetic achievement have been made into frequency distributions, which may be found on pages 198 and 200. The value of chi-square obtained from the application of this statistic to the contingency tables derived from the frequency distribution was 11.24 for reading achievement. The probability level for this value proved to be greater than .15, which is not statistically significant. The same computation applied to the scores made on the post-test in arithmetic achievement gave a chi-square

value of 6.08 and a probability level of greater than .50. This level of probability would indicate that there was no significant difference between the experimental and control groups in arithmetic achievement. These data are presented in tabular form below.

TABLE 10

PROBABILITY LEVELS OBTAINED BY COMPARING EXPERIMENTAL AND CONTROL GROUPS OF THE 90-109 I.Q. GROUP ON PRE-TESTS AND POST-TESTS IN READING ACHIEVEMENT AND ARITHMETIC ACHIEVEMENT

	READING		ARITHMETIC	
	1948	1949	1948	1949
CHI-SQUARE	5.85	11.24	7.99	6.08
DEGREES OF FREEDOM	7	7	6	8
PROBABILITY LEVEL	>.50	>.15	>.20	>.50

The Group Having I.Q.'s 110 and Over. The scores made on post-tests by pupils of the experimental and control groups having intelligence quotients of 110 and over are shown plotted in a frequency distribution on page 202. These scores are in terms of grade-points made on reading and arithmetic achievement tests. When chi-square was utilized in connection with the contingency table obtained from the distribution of reading achievement scores, a value of 15.39 was derived. The level of probability for this chi-square value was greater than .05, which is not statistically significant and indicates that any difference between the experimental and control groups in reading achievement is due to chance.

The test of independence applied to the frequency distributions of pupil scores made on the post-test in arithmetic

achievement yielded a chi-square value of 15.75. The probability level for this chi-square value proved to be statistically significant at the five percent level, which would indicate that in less than five percent of the cases is the difference in arithmetic achievement due to chance alone. The values of chi-square obtained and the appropriate levels of probability for varying degrees of freedom are present in Table 11 for each of the testing periods in reading and arithmetic achievement.

TABLE 11

PROBABILITY LEVELS OBTAINED BY COMPARING EXPERIMENTAL AND CONTROL GROUPS OF THE 110 AND OVER I.Q. GROUP ON PRE-TESTS AND POST-TESTS IN READING ACHIEVEMENT AND ARITHMETIC ACHIEVEMENT

	READING		ARITHMETIC	
	1948	1949	1948	1949
CHI-SQUARE	10.37	15.39	9.84	15.75
DEGREES OF FREEDOM	7	8	7	7
PROBABILITY LEVEL	>.10	>.05	>.10	<.05*

* Statistical Significance

In order to determine the direction of the significance i.e., whether it favored the experimental or control group, an analysis of the contingency table for the achievement scores made on the post-test was done. This contingency table is given in Appendix D. The analysis showed that there was no consistent direction indicated, but rather, each group contributed to the high chi-square value. This, in effect, "cancelled out" any positive trend toward either experimental or control group, while at the same time producing the statistically

significant chi-square value. In short, the significance was due to difference between cells of the contingency table and not due wholely to difference between groups.

Even while the foregoing is true, it is possible to distinguish one trend which bears mention. In comparing the experimental group's contingency tables for 1948 and 1949 it becomes evident that in 1949 fewer cases (42 percent) were in the cell of the contingency table in which the median case fell. The same number of cases were in the cells below the "median cell", while more cases (39 percent) were in the cells above the median cell, as compared to 1948. This means that during the time when these pupils had a child study teacher, 18.5 percent of the total group advanced from the median cell to those cells above it. This same pattern is also noticeable when the contingency tables of the control group for 1948 and 1949 are compared. In 1949 there were fewer cases (10 percent) in the cells below the median cell; fewer cases in the median cell (28 percent); and more cases (25 percent) in the cells above the median cell. Interpreted, this would mean that 11.5 percent of the total pupils in the control group advanced from the median cell and those below it to the cells of the contingency table above the median.

The generalization to be drawn from the preceding analysis is that while the pupils of both the control and experimental groups exhibit a tendency to advance from achievement levels below and including the median cell to those levels above the median cell, this tendency is present to a more marked degree in the experimental group. This tendency is not sufficient enough to refute the null hypotheses.

The data presented in this section sustain the null hypothesis that there is no difference between experimental and control groups in reading and arithmetic achievement, of pupils in the 70-89 I.Q. group, pupils in the 90-109 I.Q. group, or pupils having I.Q.'s over 110, resulting from teacher participation in the child study program.

RESULTS PERTAINING TO ACHIEVEMENT OF PUPILS FROM SELECTED SUB-CULTURAL GROUPS

Polish Ethnic Group. Frequency distributions in terms of grade-points were constructed from the scores on reading and arithmetic achievement tests administered at the end of the experimental period to pupils in the Polish ethnic group. Scores made on the intelligence test were also used to construct frequency distributions.

In the latter quality, the level of probability obtained from applying the statistic shi-square to the contingency table derived from the frequency distributions was greater than .80. This serves to indicate that during the experimental period, both experimental and control pupils of the Polish ethnic group remained comparable in intelligence as measured by the Kuhlmann-Anderson Intelligence Test.

The probability level of .70 obtained from using chi-square in connection with the frequency distributions of achievement scores on the post-test in reading shows that there is no statistically significant difference between the experimental and control groups. During the experimental period, therefore, the pupils of the Polish ethnic group, whether in the experimental or control group, achieved at comparable rates.

This statement would also hold true in regard to arithmetic achievement during the experimental period. The statistic chi-square applied to the contingency table drawn from the frequency distributions (p. 210) yielded a level of probability which was greater than .50. Any difference between the experimental and control pupils of the Polish ethnic group in arithmetic achievement is due to chance and not causal factors, as indicated by the derived level of probability.

The data mentioned in the foregoing discussion are presented below in tabular form for purpose of clarification.

TABLE 12

PROBABILITY LEVELS OBTAINED BY COMPARING EXPERIMENTAL AND CONTROL GROUPS OF THE POLISH ETHNIC GROUP ON PRE-TESTS AND POST-TESTS IN INTELLIGENCE, READING ACHIEVEMENT, AND ARITHMETIC ACHIEVEMENT

	INTELLIGENCE		READING		ARITHMETIC	
	1948	1949	1948	1949	1948	1949
CHI-SQUARE	2.40	2.49	2.98	4.52	1.98	3.40
DEGREES OF FREEDOM	5	7	5	7	3	5
PROBABILITY LEVEL	>.70	>.80	>.70	>.70	>.50	>.50

Jewish Religious Group. It will be remembered from Chapter III that the pupils of the experimental and control groups comprising the Jewish religious group, were comparable in terms of intelligence quotients, reading achievement, and arithmetic achievement at the outset of the experiment. For the final appraisal of intelligence, reading achievement, and arithmetic achievement, the Kuhlmann-Anderson Intelligence Test Grade VI, and the Stanford Intermediate Reading and Arithmetic tests Form H-partial were administered, respectively.

The scores made by pupils of the experimental and control groups on the post-test in intelligence were plotted on the frequency distributions given on page 212. The application of chi-square to the contingency table constructed from the distribution of scores yielded a value of .70 for four degrees of freedom. This value falls below the five percent level of significance, and indicates that both groups remained comparable in intelligence as measured by a group intelligence test.

The chi-square value obtained from comparing the scores made by experimental and control pupils on the post-test in reading achievement was .80 for eight degrees of freedom. Since this value falls below the five percent level of significance it, too, indicates that the differences between the experimental and control groups in reading achievement are due to chance. The frequency distributions of pupil scores made on the post-test in reading achievement, can be found on page 214.

The frequency distributions of scores made by pupils of the experimental and control groups on the post-test in arithmetic achievement are shown on page 216. The value of x^2 (9.50) obtained on the basis of the data in the contingency table is not statistically significant. The obtained value falls between the five and ten percent levels of probability for five degrees of freedom. In this instance the difference between the groups is again due to chance, even though the level of probability approaches statistical significance.

The chi-square values and probability levels for the appropriate degrees of freedom obtained from comparing scores made on post-tests in intelligence, reading achievement, and arithmetic achievement are shown in Table 13.

TABLE 13

PROBABILITY LEVELS OBTAINED BY COMPARING EXPERIMENTAL AND CONTROL GROUPS OF THE JEWISH RELIGIOUS GROUP ON PRE-TESTS AND POST-TESTS IN INTELLIGENCE, READING ACHIEVEMENT, AND ARITHMETIC ACHIEVEMENT

	INTELLIGENCE		READING		ARITHMETIC	
	1948	1949	1948	1949	1948	1949
CHI-SQUARE	1.28	1.86	3.50	4.36	1.86	9.50
DEGREES OF FREEDOM	4	4	7	8	3	5
PROBABILITY LEVEL	>.80	>.70	>.80	>.80	>.50	>.05

Using the data obtained from post-tests in intelligence, reading achievement, and arithmetic achievement, analyses were made of the significance of the differences of experimental and control pupils of the Jewish religious group. The chi-square values in each instance except one fell below the fifty percent level of significance. It is concluded, therefore, that there is no difference in achievement of the experimental and control groups at the beginning of the study, and no difference exists in their respective achievements on intelligence, reading, and arithmetic tests at the close of the experimental period. The null hypothesis that there is no difference between experimental and control groups in reading and arithmetic achievement, or changes in the I.Q. of pupils from the Jewish religious group because of teacher participation in the child study program is sustained.

RESULTS PERTAINING TO ACHIEVEMENT OF PUPILS FROM THE VARIOUS SOCIAL CLASSES

Comparisons of scores made on post-tests in intelligence, reading achievement, and arithmetic achievement will be presented in this section for pupils of the control and experimental group who were rated as belonging to the upper-middle, lower-middle, upper-lower, and lower-lower social classes. The results of the comparisons will be presented in terms of social class groupings in the order listed.

Upper-Middle Class. The chi-square value obtained from comparing the intelligence test scores made by pupils of the experimental and control groups who were rated as belonging to the upper-middle social class, was 4.36. For five degrees of freedom this yielded a probability level of .50, which is not statistically significant and indicates that the experimental and control groups remained comparable in terms of intelligence quotients. The same can be said of the experimental and control pupils of this particular social class group in regard to reading achievement. Analysis was made of the significance of the difference of experimental and control group pupils on the post-test in reading achievement. The frequency distributions of these test results are shown on page 220. The value obtained from the application of chi-square to the data was 7.48. This value falls below the five percent level of significance and shows that the experimental and control groups remained comparable.

The value of x^2 (1.18) obtained on the basis of data from the administration of final arithmetic achievement tests,

is not significant. The obtained value falls between the 50 and 60 percent levels of probability for two degrees of freedom. The contingency table for this test of significance is presented in Appendix D, as are the frequency distributions from which it was derived. From the results of the test for significance of the difference it can be said that the experimental and control groups of the upper-middle social class exhibited no statistically significant differences in arithmetic achievement.

Lower-Middle Class. At the close of the experimental period the experimental and control pupils of the lower-middle social class showed no significant difference in intelligence quotients. Chi-square, applied to the data derived from post-tests in intelligence, gave a value of 9.66 for six degrees of freedom. This value falls between the 10 and 20 percent levels of probability, indicating that the groups were not significantly independent.

The frequency distributions on page 226 presents the scores, in terms of grade-points, made on the post-test in reading achievement by the experimental and control pupils. The application of the statistic chi-square to the contingency table (Appendix D) drawn from the distribution resulted in a value of 17.56 for eight degrees of freedom. The probability for this value falls between the two percent and five percent levels which is statistically significant. An analysis of the contingency table reveals, however, that there is no consistent direction to the significance. The significance is due, in the main, to differences between cells of the contingency table and not consistently between groups. It should be noted

that pupils of both the experimental and control groups showed a tendency to move from achievement levels below and including the median cell of the contingency table to those cells above the median cell. Neither group exhibited a more marked tendency to do this than the other.

The experimental and control pupils of the lower-middle social class were not comparable in terms of arithmetic achievement at the beginning of the experimental period; therefore, no consideration can be given to changes during the experimental period. It would seem that the same factors causing independence of the groups at the beginning of the experiment continued to operate. This is indicated by the chi-square value of 23.42 obtained from comparing scores made on the post-test in arithmetic achievement. For seven degrees of freedom the value yielded a probability level below the one percent level.

Upper-Lower Class. The scores made on post-tests in intelligence, reading achievement, and arithmetic achievement, by pupils of the experimental and control groups show that comparability of achievement was maintained during the experimental period. In intelligence, the level of probability obtained from applying chi-square to the test results data was greater than 10 percent for four degrees of freedom. Likewise, the value of x^2 (6.06) obtained on the basis of reading achievement scores is not significant. The obtained value falls between the 10 and 20 percent levels of probability for four degrees of freedom. The probability level derived from utilizing the statistic chi-square in connection with arithmetic achievement

scores was not significant. The x^2 value of 3.38 (4 d.f.) yielded a level of probability between 30 and 50 percent.

The experimental and control groups of the upper-lower social class proved that they were not independent of each other in achievement during the experimental period. This is supported by the statistically insignificant levels of probability obtained from the application of chi-square to the test results data from post-tests in intelligence, reading achievement, and arithmetic achievement.

The contingency tables and frequency distributions for the above analyses are presented in Appendix D.

Lower-Lower Class. The experimental and control pupils of the lower-lower social class continued to achieve at comparable rates during the experimental periods. Scores on post-tests in intelligence, reading achievement, and arithmetic achievement were made into frequency distributions (page 236) and contingency tables (Appendix D) derived from them. On all of these achievements the levels of probability yielded by the application of chi-square were greater than 20 percent.

For six degrees of freedom, chi-square, applied to intelligence test scores, gave a value of 7.34, and a probability level of greater than 20 percent. In reading achievement and arithmetic achievement the values obtained from the use of chi-square were 4.64, and 3.46, respectively. In both instances the level of probability was greater than 30 percent for the appropriate degrees of freedom.

The foregoing analyses indicate that there were no statistically significant differences in achievement of experimental and control pupils during the experimental period.

Summary of Results Pertaining to Achievement of Pupils from the Various Social Classes. A summary table is presented at this point of the analyses made of the significance of the difference of experimental and control pupils on post-tests in intelligence, reading achievement, and arithmetic achievement.

TABLE 14

PROBABILITY LEVELS OBTAINED BY COMPARING EXPERIMENTAL AND CONTROL GROUPS OF THE VARIOUS SOCIAL CLASSES ON POST-TESTS IN INTELLIGENCE, READING ACHIEVEMENT, AND ARITHMETIC ACHIEVEMENT

	CHI-SQUARE	d.f.	PROBABILITY LEVEL
UPPER-MIDDLE			
Intelligence	4.36	5	>.50
Reading Achievement	7.48	6	>.20
Arithmetic Achievement	1.18	2	>.50
LOWER-MIDDLE			
Intelligence	9.66	6	>.10
Reading Achievement	17.56	8	>.02*
Arithmetic Achievement	23.42	7	<.01*
UPPER-LOWER			
Intelligence	7.32	4	>.10
Reading Achievement	6.06	4	>.10
Arithmetic Achievement	3.38	4	>.30
LOWER-LOWER			
Intelligence	7.34	6	>.20
Reading Achievement	4.64	5	>.30
Arithmetic Achievement	3.46	5	>.50

* Statistical Significance

On the basis of the data presented in Table 14, it can be said that in only two of the twelve tests for significance of the difference did the analyses prove that there was a statistically significant difference between experimental and

control pupils on final tests of achievement. One of these cases was in reading achievement of the lower-middle social class group. An examination of the contingency table revealed that there was no consistent direction to the significance, but it was due, primarily, to differences between cells of the contingency table and not consistently between groups. The second case of significance was not considered in the final analysis because the experimental and control groups were not comparable at the outset of the investigation. The case in point is that of arithmetic achievement of the lower-middle class pupils.

In the case of the experimental and control groups compared by social class standing in the remaining ten cases, the differences observed are not statistically significant. Therefore, the null hypothesis that there is no difference between experimental and control groups, in reading and arithmetic achievement, or changes in the I.Q., of pupils from the various social classes, resulting from teacher participation in the child study program is sustained.

RESULTS PERTAINING TO ACHIEVEMENT OF PUPILS FOR WHOM GRADE EXPECTANCY HAS BEEN DETERMINED BY MENTAL AGE

The level of pupil achievement, relative to mental age, was investigated both at the start and at the conclusion of the experimental period in an effort to ascertain the changes that took place within the experimental and control groups. The appraisal methods employed were directed toward investigation of reading and arithmetic achievement as measured by the

Stanford Intermediate Reading test, Form H-partial, and the Stanford Intermediate Arithmetic test, form H-partial.

Grade expectancy was determined for each pupil on the basis of the mental age score derived from a group intelligence test. A pupil was considered as performing at grade expectancy if his grade-point scores on the achievement tests were within two months (.2) of his expected grade level as determined by mental age.

The tabulations reported in Tables 15, 16, 17, and 18 are in terms of the number of pupils achieving at grade expectancy, below grade expectancy, and above grade expectancy. Tables 15 and 16 present a summary of the tabulations on reading achievement and arithmetic achievement, respectively, for the control group at the beginning and end of the experimental period. Tables 17 and 18 present the same data for the experimental group.

TABLE 15

READING ACHIEVEMENT OF CONTROL GROUP PUPILS AT THE BEGINNING AND END OF EXPERIMENTAL PERIOD

	At Grade Expectancy	Above Grade Expectancy	Below Grade Expectancy	Total
Beginning of Experimental Period	26	76	58	160
End of Experimental Period	28	73	59	160
TOTAL	54	149	117	320
Chi-Square = .12		Chi-Square values at: (2 d.f.)		.05 = 5.99 .01 = 9.21

The value of chi-square obtained on the basis of the data in Table 15 is not statistically significant. The obtained value falls below the 90 percent level of probability for two degrees of freedom.

TABLE 16

ARITHMETIC ACHIEVEMENT OF CONTROL GROUP PUPILS AT THE BEGINNING AND END OF EXPERIMENTAL PERIOD

	At Grade Expectancy	Above Grade Expectancy	Below Grade Expectancy	Total
Beginning of Experimental Period	39	36	85	160
End of Experimental Period	34	46	80	160
TOTAL	73	82	165	320
Chi-Square = 1.70		Chi-Square values at: (2 d.f.)		.05 = 5.99 .01 = 9.21

The value of x^2 (1.70) obtained on the basis of the data in Table 16 is not statistically significant. The obtained value falls between the 30 and 40 percent levels of probability for two degrees of freedom.

The foregoing tabular data present evidence to show that there were no significant differences within the control group, in terms of reading and arithmetic achievement, during the experimental period.

Table 17 and 18 present the data essential to an analysis of the reading and arithmetic achievement for the total experimental group from the beginning to the end of the experimental period. The chi-square value obtained in the

case of reading reveals that no statistically significant changes occurred in the levels of group achievement even though significance was approached. The same condition holds true in the case of arithmetic achievement since the same chi-square value (5.12) was obtained in each analysis. Summary tables are presented at this point with the appropriate tests of significance.

TABLE 17

READING ACHIEVEMENT OF EXPERIMENTAL GROUP PUPILS AT THE BEGINNING AND END OF EXPERIMENTAL PERIOD

	At Grade Expectancy	Above Grade Expectancy	Below Grade Expectancy	Total
Beginning of Experimental Period	46	59	55	160
End of Experimental Period	29	65	66	160
TOTAL	75	124	121	320
Chi-Square = 5.12		Chi-Square values at: (2 d.f.)		.05 = 5.99 .01 = 9.21

The value of chi-square obtained on the basis of the data in the preceding table is not statistically significant even though it approaches significance. The obtained value falls between the 5 and 10 percent levels of probability.

TABLE 18

ARITHMETIC ACHIEVEMENT OF EXPERIMENTAL GROUP PUPILS AT THE BEGINNING AND END OF THE EXPERIMENTAL PERIOD

	At Grade Expectancy	Above Grade Expectancy	Below Grade Expectancy	Total
Beginning of Experimental Period	40	38	82	160
End of Experimental Period	26	52	82	160
TOTAL	66	90	164	320
Chi-Square = 5.12		Chi-Square values at: (2 d.f.)		.05 = 5.99 .01 = 9.21

Here, again, the chi-square value obtained indicates that statistical significance is closely approached but not reached. The obtained value falls between the 5 and 10 percent levels of probability. Examination of the contingency table reveals that there has been a decrease in the number of pupils achieving at grade expectancy, and an increase in the number achieving above grade expectancy during the experimental period. There was no change in the number of pupils achieving below grade expectancy.

The chi-square values in each of the four preceding analyses (Tables 15, 16, 17, and 18) fall below the five percent level of significant differences in reading and arithmetic achievement within the experimental and control groups during the experimental period. The null hypothesis that child study teachers have not affected the level of experimental group achievement (as determined by mental age) in reading and

arithmetic any more than the non-child study teachers have affected the level of control group achievement is sustained.

RESULTS PERTAINING TO ATTENDANCE

In Chapter I of this study it was stated that the attendance of the pupils in the experimental and control groups was being investigated because of the effect it could have on achievement. Perhaps, in some respects, this phase of the investigation exercises a control over the study during the experimental period.

The average attendance for each of the school pairs for the first and second terms of the school year 1948-1949 is shown in Table 19.

TABLE 19

AVERAGE NUMBER OF DAYS ATTENDED DURING FIRST AND SECOND TERMS OF SCHOOL YEAR 1948-1949 BY PUPILS OF EXPERIMENTAL AND CONTROL GROUPS

SCHOOL	EXPERIMENTAL GROUP		CONTROL GROUP	
	First Term	Second Term	First Term	Second Term
A	83.5	87.0	85.3	90.8
B	86.8	83.0	89.0	91.3
C	86.3	89.4	84.4	86.5
D	85.0	90.0	80.0	88.7
E	80.0	87.0	80.0	87.5
F	83.0	88.6	85.9	89.0
G	86.0	93.0	81.0	87.0
H	84.8	86.8	86.2	89.9
I	80.0	93.0	80.4	88.5

Total Number of Days in First Term = 91
Total Number of Days in Second Term = 97

Analysis of the attendance data on Table 19 indicates that there is no statistically significant difference between any of the school-pairs comprising the experimental and control groups. Applying chi-square to the data yields a probability level above the 80 percent level in all cases. The null hypothesis that there is no difference in the attendance of experimental and control pupils during the experimental period is, therefore, sustained.

An analysis of the data is to be made at the point quite apart from the original intent of this phase of the investigation. It is realized that there are many factors pertaining to pupil attendance that are difficult, if not impossible to control; however, the ensuing analysis will take place in terms of the percentage of attendance for each of the school-pairs during the first and second terms of the experimental period. These data are presented in Table 20.

TABLE 20

PERCENTAGE OF ATTENDANCE FOR SCHOOL-PAIRS DURING FIRST AND SECOND TERMS OF THE EXPERIMENTAL PERIOD

SCHOOL	EXPERIMENTAL GROUP		CONTROL GROUP	
	First Term	Second Term	First Term	Second Term
A	92.6	89.6	93.7	93.6
B	95.3	91.2	97.8	94.1
C	94.7	92.1	92.7	89.1
D	94.4	92.7	89.9	91.4
E	87.9	89.6	87.9	90.2
F	91.2	91.3	94.4	91.7
G	94.5	95.8	89.0	89.6
H	93.1	95.3	94.7	92.6
I	87.9	95.8	87.9	91.2
AVERAGE TOTAL	92.4%	92.6%	92.0%	91.5%

From the tabular data it can be seen that within each of the experimental and control groups four schools improved in attendance during the second term, four showed a lower percentage of attendance, and one school had practically the same percentage of attendance. Neither the experimental nor control group appeared to have a consistent trend in attendance during the experimental period.

In the succeeding chapter, the results pertinent to each hypotheses are summarized together with a concluding statement for each of the hypotheses. Implications of the results for education and suggestions for further related research are presented.

CHAPTER V

SUMMARY, CONCLUSIONS AND IMPLICATIONS

SUMMARY

The American Council on Education, through the Commission on Teacher Education, initiated an in-service program for the purpose of studying the behavior and development of children. Begun in 1939, the in-service program has evolved as a series of experiences and procedures through which teachers might gain understanding of a child's behavior and development. These experiences and procedures, organized in a three-year sequence, were developed by teacher groups with the help of Prescott and a field consultant staff while working with many child study groups in various parts of the United States.

Research designed to measure the effectiveness of the child study program has largely been in terms of the changes that take place in teachers as a result of participation in the program. Through questions voiced by teachers and administrators a need has been indicated for studying the influence that teacher participation in an in-service program of child study has upon pupils. As a step in fulfilling the need the present research investigated the effect of teacher participation in child study upon pupil achievement in reading and arithmetic.

Hypotheses to be tested. The problem breaks down into specific aspects, stated below in the form of questions.

1. Are there differences in reading achievement, arithmetic achievement, or intelligence quotient

of pupils in the 70-89 I.Q. group, in the 90-109 I.Q. group, and the group having intelligence quotients over 110, resulting from teacher participation in the child study program?

2. Are there changes in reading achievement, arithmetic achievement, or intelligence quotient, when children of selected sub-cultural groups have had a child study teacher?

3. What is the influence of the child study teacher on children of the different social classes as regards achievement in reading and arithmetic and change in the intelligence quotient?

4. What affect have the child study teachers had on the level of experimental group reading and arithmetic achievement when grade expectancy has been determined by mental age?

5. Have the pupils in the experimental group had better attendance during the experimental period than pupils of the control group?

Groups Selected for Study. The sample of groups used in this study consisted of eighteen fifth grade classes in nine white elementary schools in Baltimore, Maryland, during the school year 1948-1949. These eighteen classes represent nine pairs; one pair contributed by each of the nine schools. One of the classes in each school was designated as the experimental class and the other as the control class. The experimental class denotes the group for which the teacher had completed three years of the in-service program of child study sponsored by the Institute for Child Study of the University of Maryland.

Three hundred twenty pupils were included in the study; 160 pupils in each of the total experimental and control groups. Experimental group pupils were selected by determining which fifth grade teachers had completed the child study program,

and then equating the intelligence quotients of their pupils with pupils having non-child study teachers. This necessitated each school having two fifth grade teachers; one having completed three years of the in-service program of child study and the other who had not participated in the child study program. Another factor in the selection of schools was the degree of geographical distribution the particular school contributed to the study. This was considered important to analyses of social class differences in pupil achievement.

Selection of teachers was made on a three-fold basis: (1) three years participation in child study for experimental group teachers, (2) non-participation in child study for control group teachers, and (3) evidence of satisfactory teaching for both experimental and control group teachers.

Collection of Data. Permission was obtained from the Bureau of Research of the Department of Education in Baltimore to use the results of standardized group tests measuring intelligence, reading achievement, and arithmetic achievement. For many years the Bureau of Research has administered these tests on a city-wide basis at the beginning of each school year and has kept a permanent file of the results.

Pre-tests administered in September, 1948 were the Kuhlmann-Anderson Intelligence test, Grade V, the Stanford Intermediate Arithmetic test, Form D-partial, and the Stanford Intermediate Reading test, Form D-partial. Post-tests administered in September, 1949 were, Grade VI, and Forms H-partial, respectively of the pre-tests. It was possible to secure pre-test and post-test results for all pupils involved

in the study because these tests had been administered prior to this investigation.

A modified form of the Index of Status Characteristics was employed to identify the social class of each school-community. Each of the nine schools was rated on the occupation, source of income, education, religion, and ethnicity of the people comprising the school-community population. The persons making the ratings were selected because of their wide knowledge of the school communities and their sensitivity to factors determining social class. The data for sub-cultural groups also were obtained from the Index of Status Characteristics form. These forms were mailed to the judges making the ratings.

Attendance data for each of the pupils in the experimental and control groups were obtained by consulting the cumulative record cards. The cumulative record cards are kept by the school which the pupil has attended.

CONCLUSIONS

The presentation of the conclusions follows the same order as the original phases of the study cited in Chapter I and the corresponding null hypotheses stated at the conclusion of Chapter III. The fundamental problem was stated at the beginning of this thesis as an hypothesis that there is no increase in pupil achievement resulting from teacher participation in three years of an in-service program of child study. The five aspects of this problem are represented by the specification of five null hypotheses under which the results were presented and which serve as the basis for the organization of this section.

1. Hypothesis: There is no difference between experimental and control groups in reading and arithmetic achievement, of pupils in the 70-89 I.Q. group, pupils in the 90-109 I.Q. group, or pupils having I.Q.'s over 110, resulting from teacher participation in the child study program.

The results presented with respect to this hypothesis in the preceding chapter show only one difference to exist in the degree to which experimental and control group pupils achieved. The difference pertains to the arithmetic achievement of pupils having intelligence quotients over 110. The difference was significant at the five percent level of probability. An anlysis of the contingency table revealed that the significance favored neither the control nor experimental group consistently, but rather, was caused by differences among the cells of the contingency table and not wholely between groups. The analysis did show that the pupils of the control and experimental groups exhibited a tendency to move from achievement levels below and including the median cell of the contingency table to levels above the median cell. This tendency was evident to a more marked degree in the experimental group even though it was not statistically significant.

Statistical analyses were made of experimental and control group reading and arithmetic achievement in each of the three I.Q. groups specified in the null hypothesis. Of the six analyses made, only the arithmetic achievement of pupils having I.Q.'s 110 and over was statistically significant. Chi-square was used in each instance to test the variation in experimental and control group achievement.

In terms of the evidence secured in this study, the null hypothesis that there is no difference between experimental and control groups in reading and arithmetic achievement of pupils in the 70-89 I.Q. group, pupils in the 90-109 I.Q. group, or pupils having I.Q.'s over 110, resulting from teacher participation in the child study program, is sustained. Therefore, within the limitations of the design of this study, it may be concluded that teacher participation in an in-service program of child study neither increases nor decreases the level of pupil achievement in reading and arithmetic.

2. Hypothesis: There is no difference between experimental and control groups in reading and arithmetic achievement, or changes in I.Q., of pupils from selected subcultural groups because of teacher participation in the child study program.

The results presented in Chapter IV in the investigation of this hypothesis do not provide evidence to refute the hypothesis. The use of chi-square in testing the variation in experimental and control group achievement yielded levels of probability above 50 percent in five of the six analyses computed. In one instance the probability level was between five and ten percent which approaches significance.

The statistical analyses made were of experimental and control group reading and arithmetic achievement, and I.Q., for each of the Polish ethnic and Jewish religious groups. All of the analyses were statistically insignificant even though the probability level obtained in the case of Jewish religious group arithmetic achievement approached statistical significance.

The evidence obtained with reference to experimental and control group pupils from the Polish ethnic and Jewish religious groups on achievement and intelligence quotients is not sufficient to refute the null hypothesis. Therefore, the null hypothesis that there is no difference between experimental and control groups in reading and arithmetic achievement, or changes in I.Q., of pupils from selected sub-cultural groups because of teacher participation in the child study program is sustained.

3. Hypothesis: There is no difference between experimental and control groups in reading or arithmetic achievement, or changes in I.Q., of pupils from the various social classes resulting from teacher participation in the child study program.

The results pertaining to this hypothesis supply evidence that within the limitations of this study there is no difference in experimental and control group achievement of pupils from the various social classes resulting from teacher participation in the child study program. The shift in achievement measured by pre-tests and post-tests was negligible in ten of the twelve analyses. Only two statistically significant differences were found for any of the various analyses completed; both occuring in the lower-middle social class group. At the outset of the investigation the experimental and control groups of the lower-middle class were not comparable in arithmetic achievement which precluded any further consideration of this quality for the group. This independence continued to be in evidence at the termination of the experiment. The lower-middle class experimental and control groups were

comparable in terms of reading achievement on pre-tests but were independent at the conclusion of the experiment. These groups were sufficiently independent to yield a probability level between two and five percent when chi-square was applied to the post-test data. Analysis of the contingency table revealed that the statistical significance favored neither the experimental nor the control group but was caused by shifts within the cells of the contingency table.

The upper-middle, upper-lower, and lower-lower social class experimental and control groups remained comparable in terms of intelligence quotients, reading achievement and arithmetic achievement. The same is true of the lower-middle social class in terms of intelligence quotients.

The evidence available in this area sustains the hypothesis that there is no difference between experimental and control groups in reading and arithmetic achievement, or changes in I.Q., of pupils from the various social classes resulting from teacher participation in the child study program.

4. Hypothesis: The child study teachers have not affected the level of experimental group achievement (as determined by mental age) in reading and arithmetic any more than the non-child study teachers have affected the level of control group achievement.

The problem in this instance focused around determining shifts in group achievement within each of the experimental and control groups. At the beginning and end of the experimental period grade expectancy in reading and arithmetic achievement was determined for each pupil on the basis of his mental age. Grade expectancy was expressed in terms of grade-points. The

statistical analyses were on the basis of the numbers of pupils achieving below grade expectancy, at grade expectancy, and above grade expectancy.

The levels of probability obtained from the application of chi-square to the control group data were not statistically significant. The obtained value in the case of reading achievement fell below the 90 percent level of probability, and in the case of arithmetic achievement the probability level was above thirty percent. Analyses of the experimental group data reveal that in both reading and arithmetic achievement the levels of probability very closely approached the five percent level of probability even though it was not reached. Examination of the contingency table for reading achievement data shows that pupils achieving at grade expectancy went to levels both above and below grade expectancy. A similar analysis of the contingency table pertaining to arithmetic achievement data shows that the high chi-square value was caused by a decrease in the number of pupils achieving at grade expectancy and an increase in the number achieving above grade level. No change was evident in the number of pupils achieving below grade expectancy.

Although statistical significance was not attained in the analyses of experimental and control group reading and arithmetic achievement it would seem to be significant that only in the case of the experimental group analyses was significance approached.

Within the limitations of the design of this study it seems reasonable to conclude that the child study teachers

have not affected the level of experimental group achievement (as determined by mental age) in reading and arithmetic any more than the non-child study teachers have affected the level of control group achievement. The null hypothesis is, therefore, sustained.

5. Hypothesis: There is no difference in the attendance of experimental and control pupils during the experimental period.

The results pertaining to this hypothesis supply definite evidence that within the limitations of this study there is no difference in the attendance of experimental and control pupils during the experimental period. When the statistic chi-square was applied to the attendance data it produced probability levels greater than eighty percent for all of the school-pairs. These levels were not statistically significant.

Further examination of the data for the purpose of revealing changes in the percentage of attendance for each of the experimental and control groups showed that there was no consistent trend within either group. In each of the experimental and control groups four schools showed an increase in percentage of attendance during the second term, four schools showed a decrease, and one school in each group showed the same percentage of attendance during the first and second terms. These data are presented in Table 20.

There is no evidence that the experimental group pupils had better attendance during the experimental period than the pupils in the control group. The null hypothesis that there is no difference in the attendance of experimental and control

pupils during the experimental period is sustained.

IMPLICATIONS

The conclusions presented in the preceding section have implications regarding the procedures and experiences of the in-service program of child study. These same conclusions have implication for the concerns of public school administrators.

In speculation pertaining to the effect of child study upon achievement it is conceivable that the nature of the experiences and procedures of the child study program need to be re-evaluated. Such a re-evaluation might take place in terms of the curriculum implications made during each year-level of the in-service program of child study. The implications would apply to particular individuals since the constellation of forces shaping the behavior of human beings varies considerably. In order to influence that facet of behavior called "scholastic achievement" specific attention could be given to relating information about the behavior of a child to curriculum practices. Knowledge of the growth, development, and behavior of human beings does not necessarily mean that such knowledge can be translated into action in connection with curriculum practices or content; therefore, it becomes important to include experiences in the child study program that will aid teachers to see how knowledge of a child's behavior can be used to further his learning. The writer is not advocating a reorganization of the basic child study experiences nor a program of curriculum revision. It <u>is</u> felt

that a deliberate effort to relate scientific concepts explaining human behavior to curriculum content and instructional procedures would have a more positive affect on the level of pupil achievement. The aforementioned relationship might start with the first year of child study and continue through the third year.

The pattern of decentralized public school administration followed in the United States gives rise to divergent philosophies of education. The findings of this investigation should indicate to those school systems holding that scholastic achievement is the primary goal of education, that teacher participation in child study does not lower pupil achievement in reading and arithmetic. Frequently the administrators of public schools that encourage and implement a philosophy of education that extends beyond mere pupil achievement in skill subject areas are subject to attack for neglecting the three "R's". The results of this investigation provide evidence showing that teacher participation in child study does not lower the level of pupil achievement. On the other hand, informal evidence from conversations with teachers suggests that pupils having child study teachers exhibit growth in extra-intellectual areas such as psychological adjustment and the manner in which they relate themselves to other children.

Many school systems are currently carrying on programs of community study in which teachers investigate the development of the social, political, and religious institutions of their school-communities. Knowledge of the development and function of these institutions gives the teachers insights

into the broader socialization factors influencing the lives of school children. The lack of statistically significant findings in connection with achievement of pupils from the various social class and sub-cultural groups suggests an integration of community study and child study in those school systems conducting both types of in-service programs. By this means a greater sensitivity to socialization processes would be developed on the part of the participating teachers, which could have a more positive affect on pupil achievement than is evidenced in this study.

The nature of this investigation and the subsequent lack of statistically significant findings has certain implications for education and also for further research. It is possible that teachers find it more difficult to influence the achievement of children in skill subjects than in content subjects. The teaching of skills may follow an established pattern which becomes impervious to insights regarding human behavior. Content subjects, as a rule, allow teachers and children more latitude in the kinds of learning situations that can be experienced. The greater range of learning situations combined with participation in a program of child study could result in increased achievement in content fields.

Suggestions for further research. Suggestions for further research following the presentation of the results of a study often take the form of recommendations, based on the experience gained, which are intended to eliminate certain limitations present in the immediate study. The suggestions

included here recognize these points and are intended also to mention certain problems directly related to the one just investigated.

The present study was limited in its experimental design to a consideration of achievement for groups of pupils. The limitations arising from the comparison of achievement for groups of pupils often obscures the effect of individual change. The application of statistical techniques to the testing of the significance of the difference in achievement between groups, likewise does not reveal what has happened to individuals. A study utilizing individual case records of both experimental and control group pupils represents one way of obtaining more particularized findings relative to the effectiveness of experimental procedures.

Further research pertaining to achievement of pupils for whom grade expectancy has been determined by mental age is suggested by the results of this study. Statistical significance at the five percent level was closely approached in the cases of experimental group reading and arithmetic achievement, but not in control group achievement. The consistency of these findings is the basis for recommending further research. The proposed research might well consider Olson's "organismic age" concept[46] relative to reading.

Further related research designed to discover the influence of teacher participation in child study upon pupil

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[46]Willard Olson and Sarita Davis, "The Adaptation of Instruction in Reading to the Growth of Children", Educational Method, Vol. 35: 71-79, November, 1940.

achievement could explore the influence over a longer period of time. It is suggested by this writer that the effect upon achievement level may be more significant as the experimental period is lengthened.

The incorporation into the experimental design of a research study of an instrument being developed by Hohl[47] is further suggested. This instrument is a paper and pencil test designed to measure the number of scientific concepts explaining human growth and development held by teachers after participation in an in-service program of child study. Use of this test as a basis for selection of teachers to be included in a piece of research similar to the present one may significantly affect the findings pertinent to pupil achievement.

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[47]George Hohl, Doctoral Dissertation in Progress, University of Chicago.

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APPENDIX A

DETERMINATION OF SOCIAL CLASS GROUPS AND SUB-CULTURAL GROUPS UTILIZING THE INDEX OF STATUS CHARACTERISTICS

The instrument used in this investigation for the prediction of social class was essentially the Index of Status Characteristics as formulated by Warner and associates.[41] The original index was based upon six status characteristics; occupation, amount of income, source of income, education, house type, and dwelling area. For the purposes of this study the modified index devised by McQuire and Loeb[42] was felt to be better suited. This index is actually a combination of Warner's characteristics pertaining to education, source of income, and occupation and McQuire and Loeb's characteristics describing religious and ethnic affiliation. The last characteristic was included in order to determine the achievement of children having sub-cultural group affiliations.

In Chapter III of this thesis it was stated that each of four judges rated the communities of the schools involved in the study on the five characteristics mentioned above. These judges were: (a) the principal and one teacher in each of the participating schools; (b) the assistant director of secondary curriculum; (c) the assistant director of elementary education; and (d) the director of special services and one visiting teacher from the respective school-communities. The bases on which the judges were selected were their wide knowledge of the various school-communities and their understanding of the factors determining social class.

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[41] W. Lloyd Warner, Marcia Meeker and Kenneth Eells, op. cit., p. 131.

[42] Carson McQuire and Martin Loeb, op.cit.

A copy of the form on which the raters made their valuations is presented at the conclusion of this appendix. The forms were mailed to the raters, filled in, and returned by mail to the writer.

In addition to filling in the form as requested, some of the respondents voluntarily provided additional information which helped in the determination of social class and sub-cultural group affiliations. Typical of this kind of information is that provided by the teacher-respondent in School A, which is given below.

1. Occupation (data obtained from results of survey)
   By far the majority of people in this community have occupations classified as manual workers, i.e., carpenters, electricians, etc.

2. Source of income (data obtained from results of survey)
   Income paid on wage basis, the amount determined by hourly rates. Paid on daily or weekly basis. Of 503 fathers, all but 40 have the type of job paid by wages.
   (apparently there are a very few families in the school whose income source is public relief)

3. Education (remarks based on opinion from occupations, letters from parents, and contact with parents)
   Probably the majority of the people have not had more than eight years schooling.

4. Religion
   Lutheran - because of large German population (opinion the school itself is probably largely protestant, because in the area served by the school these are two Catholic schools each having between 500 and 600 students).

5. Ethnicity (data obtained from results of survey)
   Largely persons with foreign sounding names who have been recent immigrants. The actual breakdown is as follows:

Germans	42%
Irish	10%
Czech	10%
Russian	6%

   About 5% are from ten different European countries.

The remainder have been in this country for at least three generations. In most cases those children giving foreign ancestry referred to the grandparents as having been born in European countries. The majority of the parents of our school children were born in this country.

6. Dwelling area (from observation)
   The community is below average since there are no open spaces, the houses are old and many built with dark middle rooms, the houses are small, very narrow row houses. While some are well-kept, the alleys are frequently dirty, poorly paved and poorly lighted. This is a business district, much truck traffic.

We now turn to an analysis of the judges' valuations for each of the nine schools on the five components of the index. These data will be presented in Tables 21 through 29. The respondents to the Index of Status Characteristics form are referred to in the tables as "Judge A", "Judge B", "Judge C", and "Judge D". The letter designation for each judge corresponds to the order in which they were listed previously.

TABLE 21

JUDGES' VALUATIONS FOR SCHOOL "A"
ON THE INDEX OF STATUS CHARACTERISTICS

Characteristic	JUDGE A	JUDGE B	JUDGE C	JUDGE D	Final Rate	Weight[43]	Score Col. 5X Col. 6
Occupation	6	6	6	7	6	4	24
Source of Income	5	5	5	5	5	3	15
Education	7	7	6	7	7	2	14
Religion	5	5	5	5	5	2	10
Ethnicity	4	4	4	2	4	1	4
						Total Index Score =	67

[43] Carson McQuire and Martin Loeb, op. cit., p. 8

TABLE 22

JUDGES' VALUATIONS FOR SCHOOL"B"
ON THE INDEX OF STATUS CHARACTERISTICS

Characteristic	JUDGE A	B	C	D	Final Rate	Weight[44]	Score Col. 5 x Col. 6
Occupation	5	0	5	5	5	4	20
Source of Income	5	0	5	5	5	3	15
Education	6	0	7	6	6	2	12
Religion	5	0	5	5	5	2	10
Ethnicity	2	0	2	2	2	1	2
						Total Index Score =	59

TABLE 23

JUDGES' VALUATIONS FOR SCHOOL "C"
ON THE INDEX OF STATUS CHARACTERISTICS

Characteristic	JUDGE A	B	C	D	Final Rate	Weight[45]	Score Col. 5 x Col. 6
Occupation	2	2	2	1	2	4	8
Source of Income	4	4	4	4	4	3	12
Education	5	4	4	4	4	2	8
Religion	0	2	2	2	2	2	4
Ethnicity	1	1	1	1	1	1	1
						Total Index Score =	33

[44] Ibid., p. 8.

[45] Ibid., p. 8.

TABLE 24

JUDGES' VALUATIONS FOR SCHOOL "D"
ON THE INDEX OF STATUS CHARACTERISTICS

Characteristic	JUDGE A	B	C	D	Final Rate	Weight[46]	Score Col. 5 x Col. 6
Occupation	5	0	5	5	5	4	20
Source of Income	5	0	5	5	5	3	15
Education	4	0	5	4	4	2	8
Religion	3	0	3	3	3	2	6
Ethnicity	1	0	1	1	1	1	1
						Total Index Score =	50

TABLE 25

JUDGES' VALUATIONS FOR SCHOOL "E"
ON THE INDEX OF STATUS CHARACTERISTICS

Characteristic	JUDGE A	B	C	D	Final Rate	Weight[47]	Score Col. 5 x Col. 6
Occupation	3	3	3	3	3	4	12
Source of Income	3	3	3	3	3	3	9
Education	3	4	4	4	4	2	8
Religion	6	6	6	6	6	2	12
Ethnicity	5	6	6	6	6	1	6
						Total Index Score =	47

[46] Ibid., p. 8.

[47] Ibid., p. 8.

TABLE 26

JUDGES' VALUATIONS FOR SCHOOL "F"
ON THE INDEX OF STATUS CHARACTERISTICS

Characteristic	JUDGE A	B	C	D	Final Rate	Weight[48]	Score Col. 5 x Col. 6
Occupation	5	0	6	5	5	4	20
Source of Income	5	0	5	5	5	3	15
Education	6	0	6	6	6	2	12
Religion	6	0	6	6	6	2	12
Ethnicity	6	Jewish 0	6	6	6	1	6
					Total Index Score =		65

TABLE 27

JUDGES' VALUATIONS FOR SCHOOL "G"
ON THE INDEX OF STATUS CHARACTERISTICS

Characteristic	JUDGE A	B	C	D	Final Rate	Weight[49]	Score Col. 5 x Col. 6
Occupation	5	6	5	5	5	4	20
Source of Income	5	5	5	5	5	3	15
Education	7	6	6	6	6	2	12
Religion	4	5	4	4	4	2	8
Ethnicity	1	1	2	1	1	1	1
					Total Index Score =		56

[48] Ibid., p. 8.

[49] Ibid., p. 8.

TABLE 28

JUDGES' VALUATIONS FOR SCHOOL "H"
ON THE INDEX OF STATUS CHARACTERISTICS

Characteristic	JUDGE A	JUDGE B	JUDGE C	JUDGE D	Final Rate	Weight[50]	Score Col. 5 x Col. 6
Occupation	5	5	5	6	5	4	20
Source of Income	5	5	5	5	5	3	15
Education	7	6	6	6	6	2	12
Religion	5	3	5	5	5	2	10
Ethnicity	4	Polish 4	4	4	4	1	4
					Total Index Score =		61

TABLE 29

JUDGES' VALUATIONS FOR SCHOOL "I"
ON THE INDEX OF STATUS CHARACTERISTICS

Characteristic	JUDGE A	JUDGE B	JUDGE C	JUDGE D	Final Rate	Weight[51]	Score Col. 5 x Col. 6
Occupation	3	3	3	3	3	4	12
Source of Income	3	3	3	3	3	3	9
Education	4	3	4	4	4	2	8
Religion	6	6	6	6	6	2	12
Ethnicity	6	6	5	6	6	1	6
					Total Index Score =		47

[50] Ibid., p. 8.

[51] Ibid., p. 8.

The total weighted score obtained for each of the school-communities from the index is the "index score" with which to predict social class position. The index score is based upon socioeconomic (occupation, source of income) and value-attitude (religion, education, ethnicity) factors.[52] The index score is used to enter the table given below.

TABLE 30

RELATIONS BETWEEN INDEX SCORE, AND SOCIAL CLASS PREDICTED[53]

Index Score	Social Class Prediction
12	(U)
13-17	
18-22	Upper
23-27	(UM)
28-32	
33-37	Upper Middle
38-41	(LM)
42-46	
47-51	Lower Middle
52-56	(UL)
57-61	
62-66	Upper Lower
67-71	(LL)
72-75	
76-84	Lower Lower

On the basis of the data presented in Table 30 it becomes apparent that School "C" is located in an upper-middle

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[52] Ibid., p. 8

[53] Adapted from Carson McQuire and Martin Loeb, op. cit., p. 6, Table I.

class community, that School "D", "E", and "I" are situated in a lower-middle class community, Schools "B", "F", "G", and "H" are in an upper-lower class community, and School "A" is in a lower-lower class community.

The judges wrote in the names of two strong sub-cultural groups known to exist in the communities of the schools involved in this investigation. School "F" was designated as being situated in a community having people of strong Jewish religious affilation, while School "H" was pointed out as being part of a community having a Polish ethnic group. Since no other groups were named by the judges, the analyses pertaining to achievement of pupils from selected sub-cultural groups was restricted to the two groups mentioned.

School #_____ Name(s) of person(s) making evaluation

_____

_____

INDEX OF STATUS CHARACTERISTICS

The purpose of this form is to make a prediction about the socio-economic status of your school community. This information will then be used to make a prediction of social class for the school-community.

There are five categories to be considered in making this prediction; occupation, source of income, education, religion, and ethnicity. On the following pages is a seven point breakdown of each of these categories. The person(s) making the evaluation will encircle, or check, the particular point in each category that applies to the majority of the people in their school community. Please write in the name of any particularly strong ethnic group known to exist in the community. This should be included in the characteristic pertaining to ethnicity. It should be borne in mind that this analysis is of the socio-economic status of the adults of the community and not directly that of school children.

In order to gain a better understanding of the use of this form let us consider a hypothetical case - that of the "Lawndale Elementary School".

The Lawndale Elementary School is situated in a community in which the people are, for the most part, tradesmen such as machinists, carpenters, and electricians. As a rule, these people are not high school graduates, but have had some

high school education. Most of the people are second-generation Germans and attend either the Lutheran or Catholic Churches in the neighborhood.

Analysis

Religion	- encircle item	#5	
Education	- "	" #5	
Ethnicity	- "	" #2	
Source of Income	- "	" #5	(by inference from type of occupation)
Occupation	- "	" #5	

Your careful consideration in making out this form will be much appreciated. Thank you for your cooperation and consideration.

INDICES OF STATUS CHARACTERISTICS

RELIGIOUS AFFILIATION

1. Congregational, Episcopalian, Unitarian; either membership or a background of family affiliation with such churches.

2. Presbyterian, Quaker, Christian Science; either membership or a background of family affiliation with such churches.

3. Methodist membership or affiliation; "none" or "Protestant" entries for subjects reporting "middle-class" occupations.

4. Baptist, Church of Christ; in some communities the Baptist Church may rate "3" and the Methodist Church "4".

5. Roman Catholic, Lutheran; high status subjects in this rating compensate by higher ratings in other characteristics.

6. Jewish and Orthodox Churches; high status subjects with this rating usually compensate in "education" or "occupation" entries.

7. Free Methodist, Gospel Tabernacle, Jehovah Witness, Pentacostal, and other "evangelical" churches; "none" for lower-class occupations.

EDUCATION OR LEVEL OF EDUCATION

1. Completed appropriate graduate work for recognized profession; or graduate of a generally recognized high-status four year college.

2. Graduated from a four-year college, university, or professional school with a recognized degree, including 4-year teacher colleges.

3. Attended college or University for two or more years; or equivalent higher education such as that for a registered nurse or teacher.

4. Graduated from high school; or completed equivalent secondary education; and including post-high "trade" or "business" training.

5. Attended high school, completed grade nine but did not graduate. (For persons 50 years or over, grades nine to 11 would be equivalent.)

6. Completed grade eight or did not go beyond grade nine in high school. (For persons 50 years or over, grades 4 to 8 would be equivalent.)

7. Did not attend school beyond grade seven or left during grade eight year. (For persons 50 years or over, grades 1 to 3 or no schooling.)

ETHNICITY (Including Caste and Sect Groupings)

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1. "Old American" or Anglo-American; including those with foreign names and whose families have been in America for a number of generations.

2. Assimilated Americans; generally persons with foreign-sounding names and whose families have been more recent immigrants but acculturated.

3. French-Canadian or Irish-Catholic groups maintaining a variant ethnic tradition about their church and related social institutions.

4. North European ethnic group or religious sect; e.g. "Norwegian Lutheran".

5. South European ethnic group or religious sect; e.g. "Italian Catholic".

6. Eastern European or Near-East peoples; e.g. "Polish Nationalist", "Russion Orthodox", "Armenian"; also southern "poor white" people.

7. Colored groups and those treated as color castes; e.g. Negro, Oriental, certain Latin American peoples with "mixed blood"; the "skid-row" populations such as those of the Bowery, etc.

   Note: Jewish families are rated according to the country of origin.

SOURCE OF INCOME

---

1. Inherited income. Families who live on money made by a previous generation. Money derived from savings and investments or business enterprise inherited from an earlier generation.

2. Earned wealth. Families living on savings or investments earned by the present generation.

3. Profits and fees. Money paid to professional men for services and fees. Also includes money made by owners of businesses for sale of goods and royalties paid to writers, musicians, etc.

4. Salary. This is a regular income paid for services on a monthly, or yearly basis. This category also includes the commission type of salary paid to salesmen.

5. Wages. Distinquished from salary since the amount is determined by an hourly rate. It is usually paid on a daily or weekly basis.

6. Private Relief. Includes money paid by friends or relatives for the sake of friendship or because of family ties. Also includes money given by churches, associations, etc. when the agency does not reveal the names of those getting help.

7. Public relief and non-respectable income. Includes money received from a government agency or from some semi-public charity organization which reveals the names of those getting help. A non-respectable income includes money made from gambling, prostitution, etc.

Rating Assigned to Occupation	Professionals	Proprietors and Managers	Business Men
1	Lawyers, Doctors, dentists, engineers, judges, high-school superintendents, veterinarians, ministers (graduated from divinity school), chemists, etc. with post-graduate training, architects	Businesses valued at $75,000 and over	Regional and divisional managers of large financial and industrial enterprises
2	High-school teachers, trained nurses, chiropodists, chiropractors, undertakers, ministers (some training), newspaper editors, librarians (graduate)	Businesses valued at $20,000 to $75,000	Assistant managers and office and department managers of large businesses, assistants to executives, etc.
3	Social workers, grade-school teachers, optometrists, librarians (not graduate), undertaker's assistants, ministers (no training)	Businesses valued at $5,000 to $20,000	All minor officials of businesses
4		Businesses valued at $2,000 to $5,000	
5		Businesses valued at $500 to $2,000	
6		Businesses valued at less than $500	

FOR RATING OCCUPATION

Clerks and Kindred Workers, Etc.	Manual Workers	Protective and Service Workers	Farmers
Certified Public Accountants			Gentleman Farmers
Accountants, salesmen of real estate, of insurance, postmasters			Large farm owners, farm owners
Auto salesmen, bank clerks and cashiers, postal clerks, secretaries to executives, supervisors of railroad, telephone, justices of the peace	Contractors	Dry cleaners	
Stenographers, bookkeepers, rural mail clerks, railroad ticket agents, sales people in dry goods store, etc.	Factory foremen, electricians plumbers carpenters watchmakers own business	Dry cleaners, butchers, sheriffs, railroad engineers and conductors	
Dime store clerks, hardware salesmen, beauty operators, telephone operators	Carpenters, plumbers, electricians (apprentice), timekeepers, linemen, telephone or telegraph, radio repairmen, medium-skill workers	Barbers, firemen, butcher's apprentices, practical nurses, policemen, seamstresses, cooks in restaurant, bartenders	Tenant farmers
	Moulders, semi-skilled workers, assistants to carpenters, etc.	Baggage men, night policemen and watchmen, taxi and truck drivers, gas station attendants, waitresses in restaurant	Small tenant farmers
	Heavy labor, migrant work, odd-job men, miners	Janitors, scrubwomen, newsboys	

APPENDIX B

BASIC DATA SHEET

PUPIL'S NAME_____ EXPERIMENTAL GROUP___

SCHOOL_____ CONTROL GROUP ___

PRE-TEST DATA
(1948)

Chronological age _____
K-A Mental age _____ estimated grade level _____
Intelligence quotient _____

Date administered _____

Stanford Intermediate Reading Achievement _____
(Form D-partial)
Stanford Intermediate Arithmetic Achievement _____
(Form D-partial)

Date administered _____

POST-TEST DATA
(1949)

Chronological age _____
K-A Mental age _____ Estimated grade level ____
Intelligence quotient _____

Date administered _____

Stanford Intermediate Reading Achievement _____
(Form H-partial)
Stanford Intermediate Arithmetic Achievement _____
(Form H-partial)

Date administered _____

(REVERSE SIDE OF BASIC DATA SHEET)

RATINGS ASSIGNED BY JUDGES
ON THE INDEX OF STATUS CHARACTERISTICS

INDEX	WEIGHT	JUDGES' SCORE	INDEX SCORE
Occupation	4		
Source of Income	3		
Education	2		
Religion	2		
Ethnicity	1		
		Total Index Score Social Class	

ATTENDANCE RECORD FOR SCHOOL YEAR
1948-1949

Term	Days Present	Days Absent	TOTAL
First			
Second			
TOTAL			

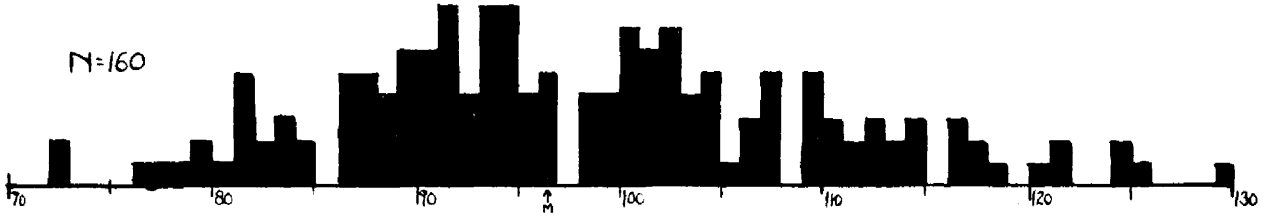
APPENDIX C

FREQUENCY DISTRIBUTIONS AND CONTINGENCY TABLES FOR PRE-TEST RESULTS

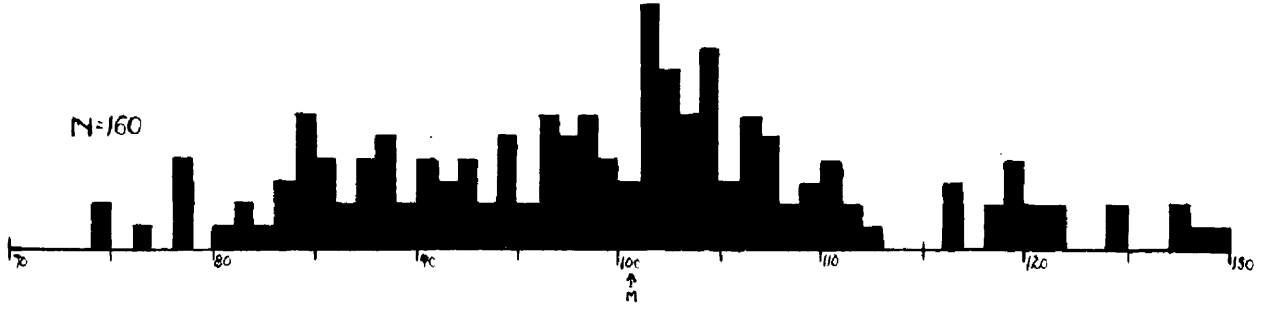
FIG. 1

DISTRIBUTION OF SCORES MADE BY
PUPILS OF THE TOTAL EXPERIMENTAL AND CONTROL GROUPS
ON THE PRE-TEST IN INTELLIGENCE

Experimental Group



Control Group



one case = .10 square inch

TABLE 31

CLASSIFICATION OF SCORES MADE BY
PUPILS OF THE TOTAL EXPERIMENTAL AND CONTROL GROUPS ON THE
PRE-TEST IN INTELLIGENCE

	Intelligence Quotients Falling in Category of							
	65-74	75-84	85-94	95-104	105-114	115-124	125-134	Total
Experimental Group	2	18	54	46	27	11	2	160
Control Group	2	18	35	60	26	15	4	160
Total	4	36	89	106	53	26	6	320

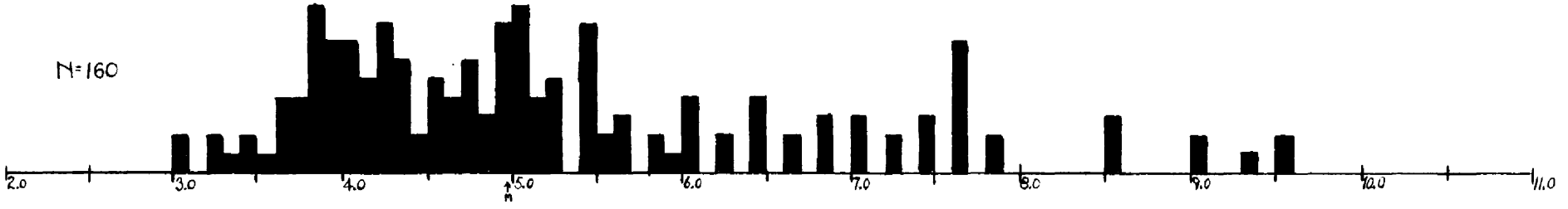
Chi-Square = 7.14

Chi-Square Values: (6 d.f.) .05 = 12.59 .01 = 16.81

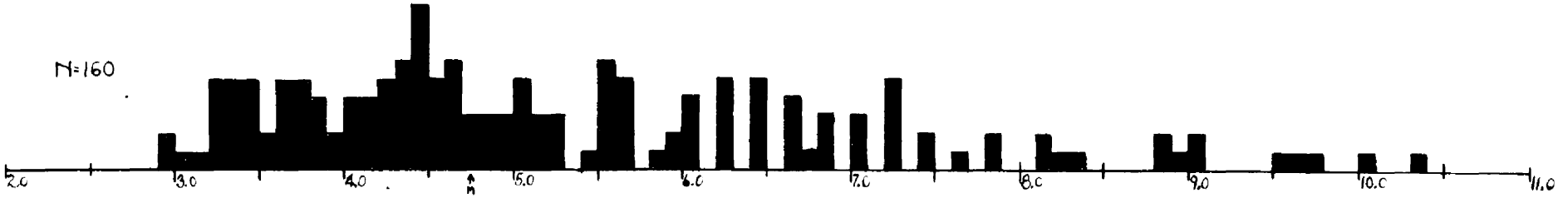
FIG. 2

DISTRIBUTION OF SCORES MADE BY
PUPILS OF THE TOTAL EXPERIMENTAL AND CONTROL GROUPS
ON THE PRE-TEST IN READING ACHIEVEMENT
(Scores in Terms of Grade-Points)

Experimental Group



Control Group



one case = .10 square inch

TABLE 32

CLASSIFICATION OF SCORES MADE BY
PUPILS OF THE TOTAL EXPERIMENTAL AND CONTROL GROUPS ON THE
PRE-TEST IN READING ACHIEVEMENT
(Scores in Terms of Grade-Points)

	Scores Falling in Category of									
	2.0-2.9	3.0-3.9	4.0-4.9	5.0-5.9	6.0-6.9	7.0-7.9	8.0-8.9	9.0-9.9	10.0-10.9	Total
Experimental Group	0	32	54	34	15	17	3	5	0	160
Control Group	2	35	48	26	22	13	7	5	2	160
Total	2	67	102	60	37	30	10	10	2	320

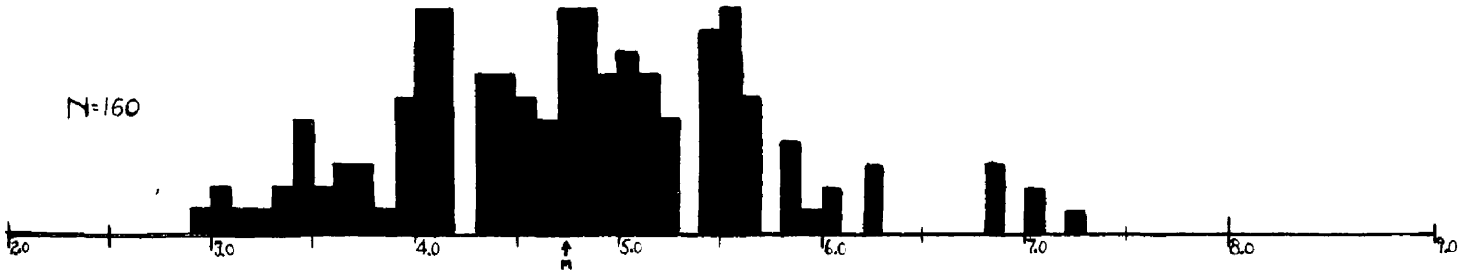
Chi-Square = 8.96

Chi-Square Values: (8 d.f.) .05 = 15.51, .01 = 20.09

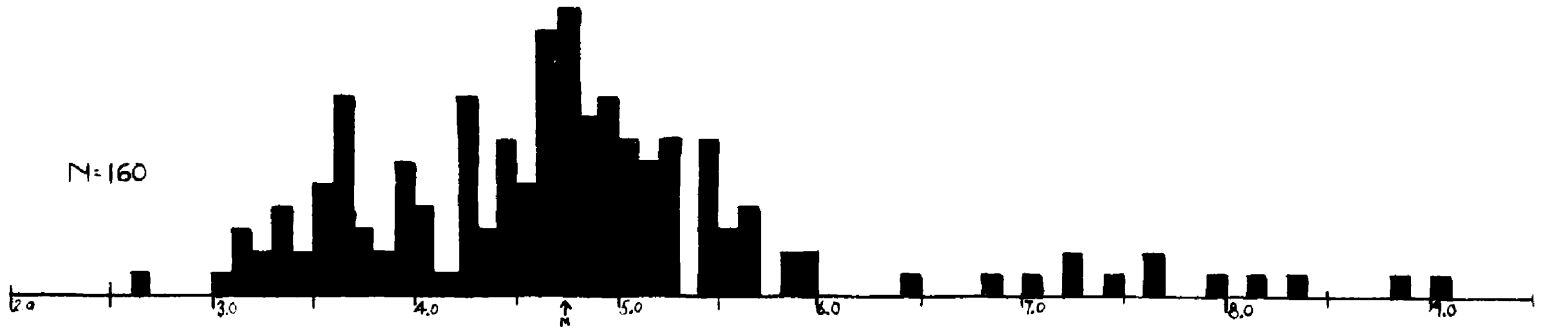
FIG. 3

DISTRIBUTION OF SCORES MADE BY
PUPILS OF THE TOTAL EXPERIMENTAL AND CONTROL GROUPS
ON THE PRE-TEST IN ARITHMETIC ACHIEVEMENT
(Scores in Terms of Grade-Points)

Experimental Group



Control Group



one case = .10 square inch

TABLE 33

CLASSIFICATION OF SCORES MADE BY
PUPILS OF THE TOTAL EXPERIMENTAL AND CONTROL GROUPS ON THE
PRE-TEST IN ARITHMETIC ACHIEVEMENT
(Scores in Terms of Grade-Points)

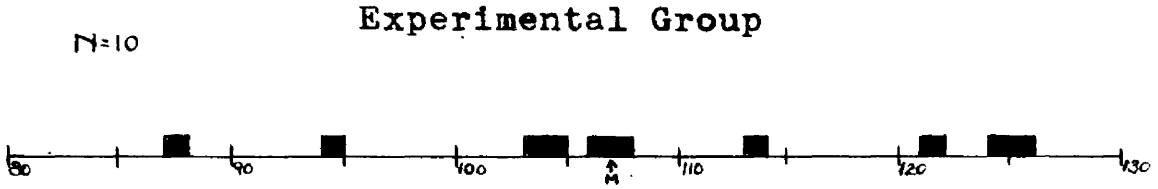
	Scores Falling in Category of								
	2.0-2.9	3.0-3.9	4.0-4.9	5.0-5.9	6.0-6.9	7.0-7.9	8.0-8.9	9.0-9.9	Total
Experimental Group	1	26	72	50	8	3	0	0	160
Control Group	1	37	71	38	2	7	3	1	160
Total	2	63	143	88	10	10	3	1	320

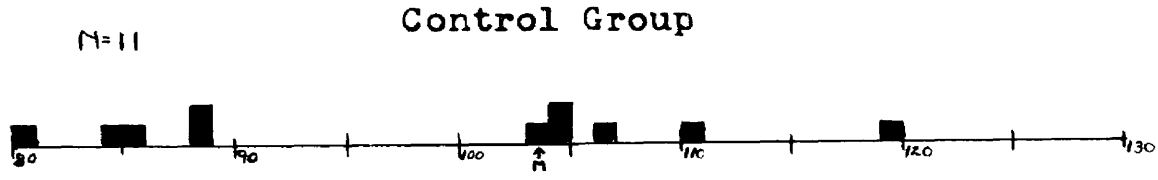
Chi-Square = 9.14

Chi-Square Values: (7 d.f.) .05 = 14.07
.01 = 18.48

FIG. 4

DISTRIBUTION OF SCORES MADE BY PUPILS OF THE UPPER-MIDDLE SOCIAL CLASS ON THE PRE-TEST IN INTELLIGENCE





one case = .10 square inch

TABLE 34

CLASSIFICATION OF SCORES MADE BY
PUPILS OF THE UPPER-MIDDLE SOCIAL CLASS ON THE
PRE-TEST IN INTELLIGENCE

	Intelligence Quotients Falling in Category of						
	75-84	85-94	95-104	105-114	115-124	125-134	Total
Experimental Group	0	2	2	3	2	1	10
Control Group	2	3	3	2	1	0	11
Total	2	5	5	5	3	1	21

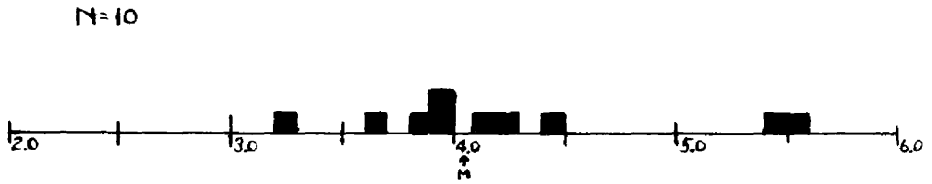
Chi-Square = 3.63

Chi-Square Values: (5 d.f.) .05 = 11.07, .01 = 15.08

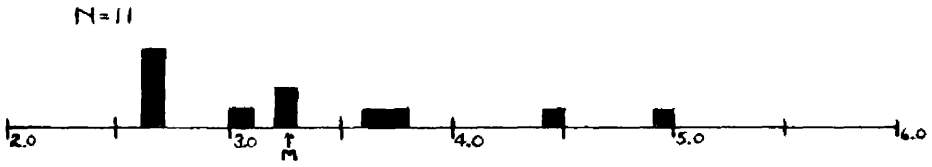
FIG. 5

DISTRIBUTION OF SCORES MADE BY PUPILS OF THE UPPER-MIDDLE SOCIAL CLASS ON THE PRE-TEST IN READING ACHIEVEMENT (Scores in Terms of Grade-Points)

Experimental Group



Control Group



one case = .10 square inch

TABLE 35

CLASSIFICATION OF SCORES MADE BY
PUPILS OF THE UPPER-MIDDLE SOCIAL CLASS ON THE
PRE-TEST IN READING ACHIEVEMENT
(Scores in Terms of Grade-Points)

	Scores Falling in Category of				
	2.0-2.9	3.0-3.9	4.0-4.9	5.0-5.9	Total
Experimental Group	0	5	3	2	10
Control Group	4	5	2	0	11
Total	4	10	5	2	21

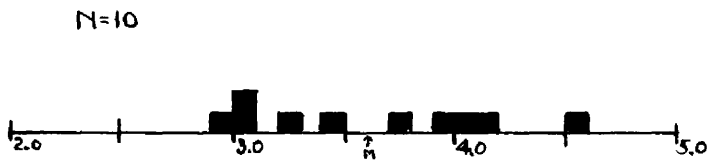
Chi-Square = 6.16

Chi-Square Values: (3 d.f.) .05 = 7.82, .01 = 11.34

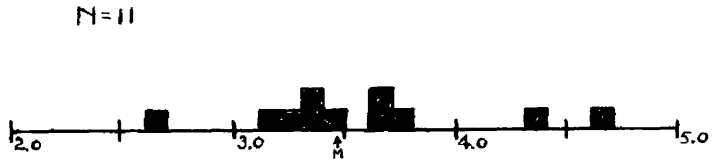
FIG. 6

DISTRIBUTION OF SCORES MADE BY PUPILS OF THE UPPER-MIDDLE SOCIAL CLASS ON THE PRE-TEST IN ARITHMETIC ACHIEVEMENT (Scores in Terms of Grade-Points)

Experimental Group



Control Group



one case = .10 square inch

TABLE 36

CLASSIFICATION OF SCORES MADE BY
PUPILS OF THE UPPER-MIDDLE SOCIAL CLASS ON THE
PRE-TEST IN ARITHMETIC ACHIEVEMENT
(Scores in Terms of Grade-Points)

	Scores Falling in Category of			
	2.0-2.9	3.0-3.9	4.0-4.9	Total
Experimental Group	1	6	3	10
Control Group	1	8	2	11
Total	2	14	5	21

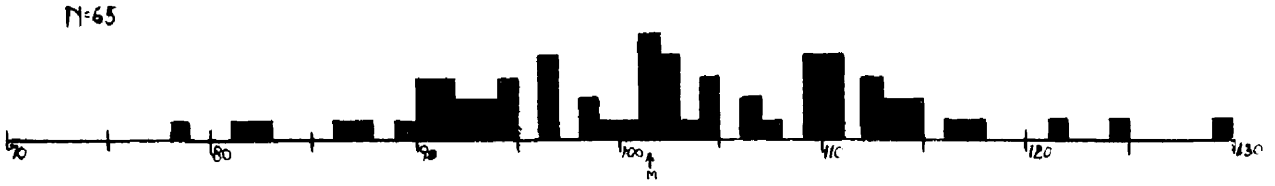
Chi-Square = .42

Chi-Square Values: (2 d.f.) .05 = 5.99, .01 = 9.21

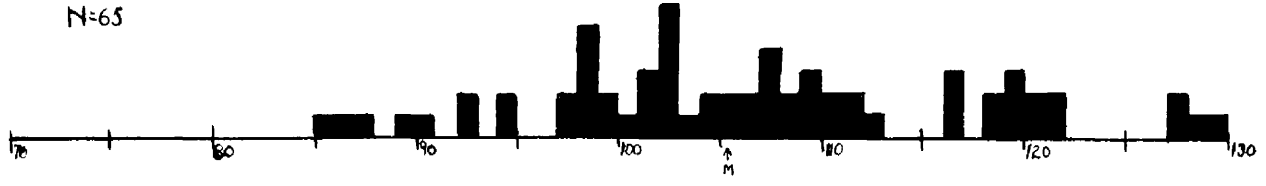
FIG. 7

DISTRIBUTION OF SCORES MADE BY
PUPILS OF THE LOWER-MIDDLE SOCIAL CLASS ON THE
PRE-TEST IN INTELLIGENCE

Experimental Group



Control Group



one case = .10 square inch

TABLE 37

CLASSIFICATION OF SCORES MADE BY
PUPILS ON THE LOWER-MIDDLE SOCIAL CLASS ON THE
PRE-TEST IN INTELLIGENCE

	Intelligence Quotients Falling in Category of						
	75-84	85-94	95-104	105-114	115-124	125-134	Total
Experimental Group	3	16	23	18	4	1	65
Control Group	0	9	22	18	12	4	65
Total	3	25	45	36	16	5	130

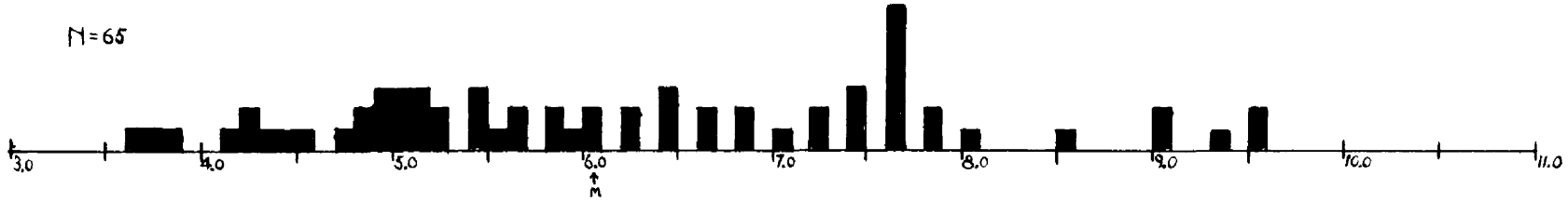
Chi-Square = 8.38

Chi-Square Values: (5 d.f.) .05 = 11.07, .01 = 15.08

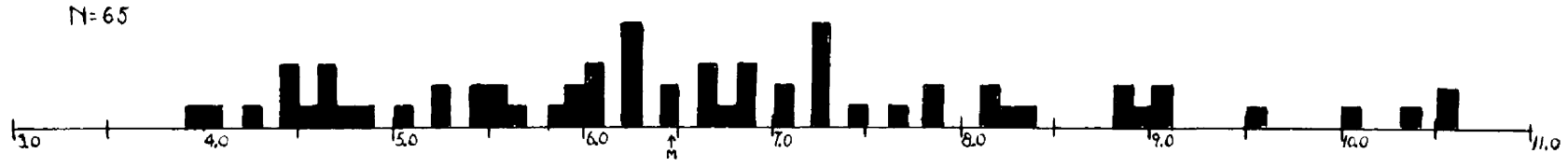
FIG. 8

DISTRIBUTION OF SCORES MADE BY
PUPILS OF THE LOWER-MIDDLE SOCIAL CLASS ON THE
PRE-TEST IN READING ACHIEVEMENT
(Scores in Terms of Grade-Points)

Experimental Group



Control Group



one case = .10 square inch

TABLE 38

CLASSIFICATION OF SCORES MADE BY
PUPILS OF THE LOWER-MIDDLE SOCIAL CLASS ON THE
PRE-TEST IN READING ACHIEVEMENT
(Scores in Terms of Grade-Points)

	Scores Falling in Category of								
	3.0-3.9	4.0-4.9	5.0-5.9	6.0-6.9	7.0-7.9	8.0-8.9	9.0-9.9	10.0-10.9	Total
Experimental Group	3	12	17	11	15	2	5	0	65
Control Group	1	11	11	17	11	7	3	4	65
Total	4	23	28	28	26	9	8	4	130

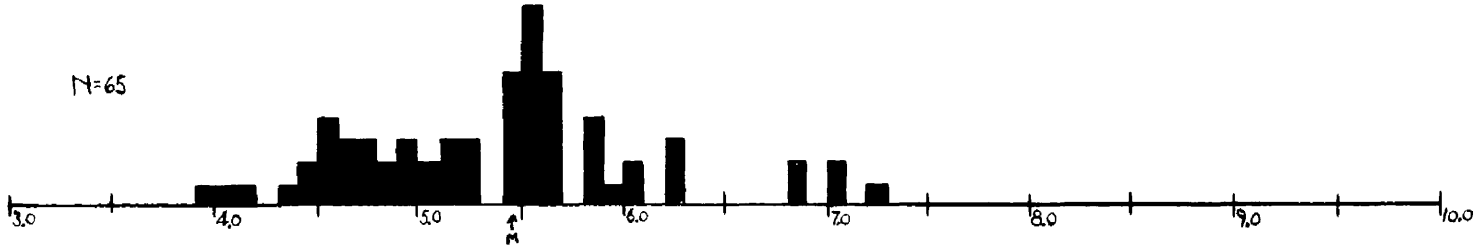
Chi-Square = 10.96

Chi-Square Values: .05=14.07
(7 d.f.) .01=18.48

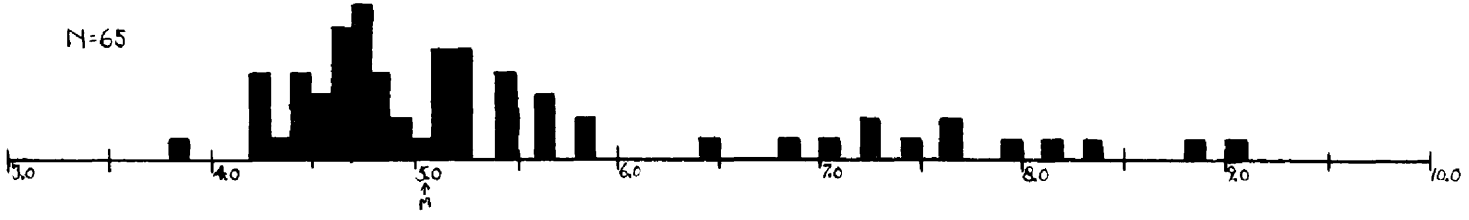
FIG. 9

DISTRIBUTION OF SCORES MADE BY
PUPILS OF THE LOWER-MIDDLE SOCIAL CLASS ON THE
PRE-TEST IN ARITHMETIC ACHIEVEMENT
(Scores in Terms of Grade-Points)

Experimental Group



Control Group



one case = .10 square inch

TABLE 39

CLASSIFICATION OF SCORES MADE BY
PUPILS OF THE LOWER-MIDDLE SOCIAL CLASS ON THE
PRE-TEST IN ARITHMETIC ACHIEVEMENT
(Scores in Terms of Grade-Points)

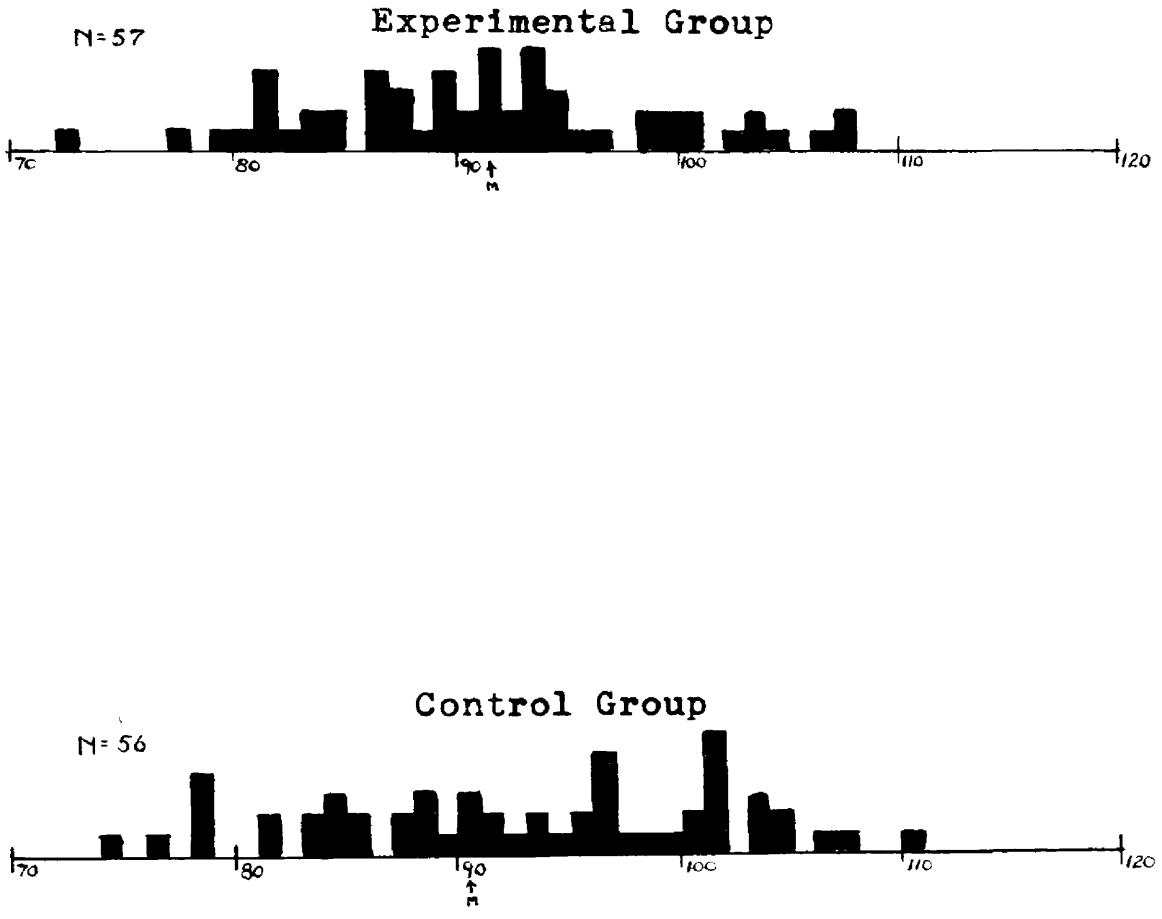
	Scores Falling in Category of							
	3.0-3.9	4.0-4.9	5.0-5.9	6.0-6.9	7.0-7.9	8.0-8.9	9.0-9.9	Total
Experimental Group	1	20	34	7	3	0	0	65
Control Group	1	31	20	2	7	3	1	65
Total	2	51	54	9	10	3	1	130

Chi-Square = 14.34

Chi-Square Values: (6 d.f.) .05 = 12.59, .01 = 16.81

FIG. 10

DISTRIBUTION OF SCORES MADE BY PUPILS OF THE UPPER-LOWER SOCIAL CLASS ON THE PRE-TEST IN INTELLIGENCE



one case = .10 square inch

TABLE 40

CLASSIFICATION OF SCORES MADE BY
PUPILS OF THE UPPER-LOWER SOCIAL CLASS ON THE
PRE-TEST IN INTELLIGENCE

	Intelligence Quotients Falling in Category of					
	65-74	75-84	85-94	95-104	105-114	Total
Experimental Group	1	12	29	12	3	57
Control Group	1	12	17	23	3	56
Total	2	24	46	35	6	113

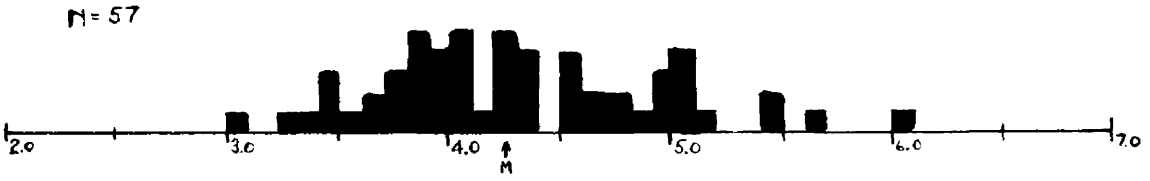
Chi Square = 7.25

Chi-Square Values: .05 = 9.48
(4 d.f.) .01 = 13.27

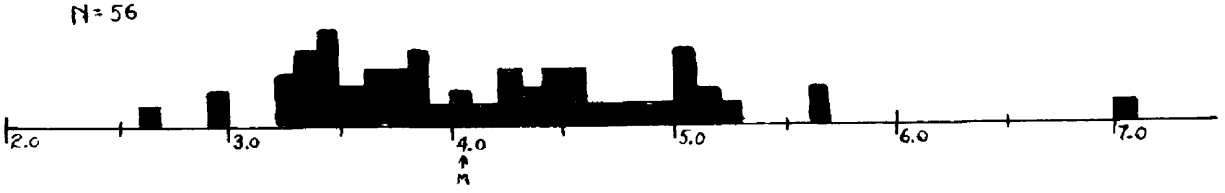
FIG. 11

DISTRIBUTION OF SCORES MADE BY PUPILS OF THE UPPER-LOWER SOCIAL CLASS ON THE PRE-TEST IN READING ACHIEVEMENT (Scores in Terms of Grade-Points)

Experimental Group



Control Group



one case = .10 square inch

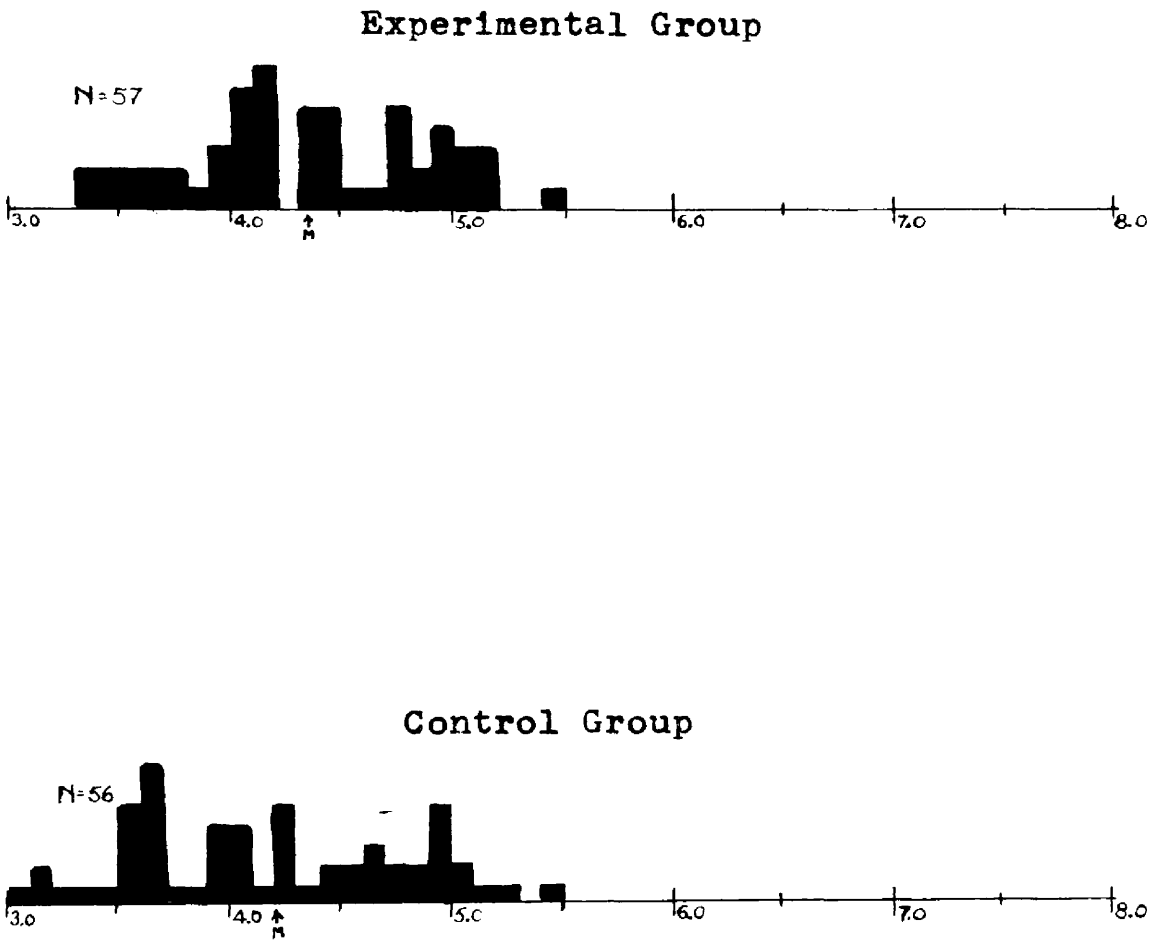
TABLE 41

CLASSIFICATION OF SCORES MADE BY
PUPILS OF THE UPPER-LOWER SOCIAL CLASS ON THE
PRE-TEST IN READING ACHIEVEMENT
(Scores in Terms of Grade-Points)

	Scores Falling in Category of						
	2.0-2.9	3.0-3.9	4.0-4.9	5.0-5.9	6.0-6.9	7.0-7.9	Total
Experimental Group	0	21	27	8	1	0	57
Control Group	3	25	18	9	0	1	56
Total	3	46	45	17	1	1	113
Chi-Square = 7.18					Chi-Square Values: (5 d.f.)	.05 = 11.07 .01 = 15.08	

FIG. 12

DISTRIBUTION OF SCORES MADE BY PUPILS OF THE UPPER-LOWER SOCIAL CLASS ON THE PRE-TEST IN ARITHMETIC ACHIEVEMENT (Scores in Terms of Grade-Points)



one case = .10 square inch

TABLE 42

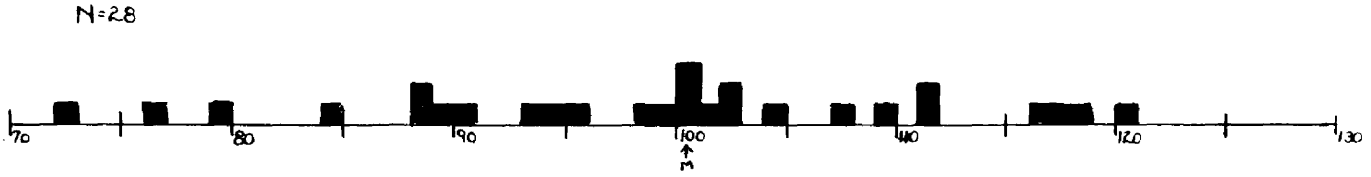
CLASSIFICATION OF SCORES MADE BY
PUPILS OF THE UPPER-LOWER SOCIAL CLASS ON THE
PRE-TEST IN ARITHMETIC ACHIEVEMENT
(Scores in Terms of Grade-Points)

	Scores Falling in Category of			
	3.0-3.9	4.0-4.9	5.0-5.9	Total
Experimental Group	14	36	7	57
Control Group	24	27	5	56
Total	38	63	12	113
Chi-Square = 4.22			Chi-Square Values: (2 d.f.)	.05 = 5.99 .01 = 9.21

FIG. 13

DISTRIBUTION OF SCORES MADE BY PUPILS OF THE LOWER-LOWER SOCIAL CLASS ON THE PRE-TEST IN INTELLIGENCE

Experimental Group



Control Group

one case = .10 square inch

TABLE 43

CLASSIFICATION OF SCORES MADE BY
PUPILS OF THE LOWER-LOWER SOCIAL CLASS ON THE
PRE-TEST IN INTELLIGENCE

	Intelligence Quotients Falling in Category of						
	65-74	75-84	85-94	95-104	105-114	115-124	Total
Experimental Group	1	3	6	10	4	4	28
Control Group	1	4	6	12	3	2	28
Total	2	7	12	22	7	6	56

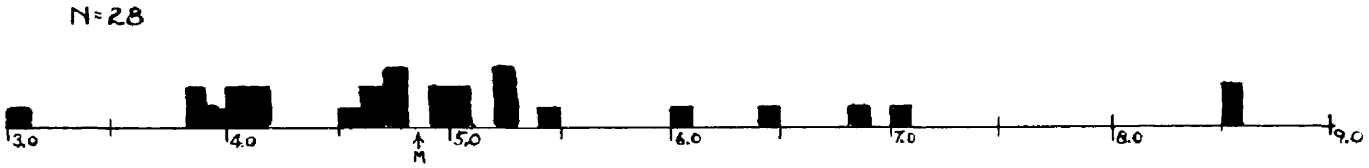
Chi-Square = 5.50

Chi-Square Values: .05 = 11.07
(5 d.f.) .01 = 15.08

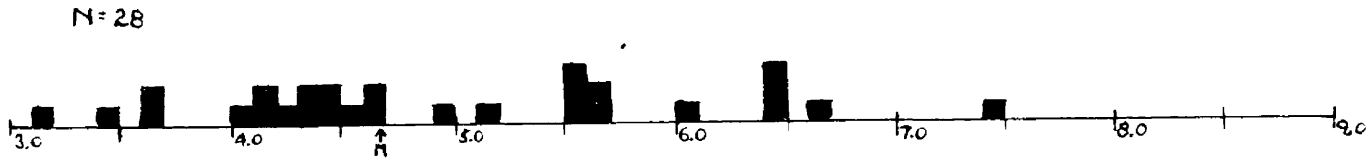
FIG. 14

DISTRIBUTION OF SCORES MADE BY PUPILS OF THE LOWER-LOWER SOCIAL CLASS ON THE PRE-TEST IN READING ACHIEVEMENT (Scores in Terms of Grade-Points)

Experimental Group



Control Group



one case = .10 square inch

TABLE 44

CLASSIFICATION OF SCORES MADE BY
PUPILS OF THE LOWER-LOWER SOCIAL CLASS ON THE
PRE-TEST IN READING ACHIEVEMENT
(Scores in Terms of Grade-Points)

	Scores Falling in Category of						
	3.0-3.9	4.0-4.9	5.0-5.9	6.0-6.9	7.0-7.9	8.0-8.9	Total
Experimental Group	4	12	6	3	1	2	28
Control Group	4	12	6	5	1	0	28
Total	8	24	12	8	2	2	56

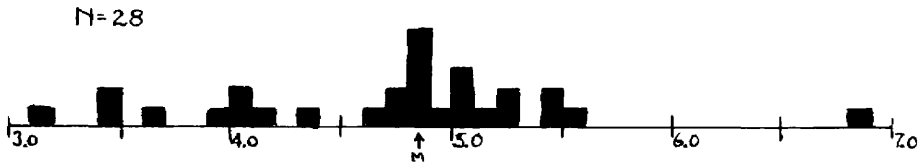
Chi-Square = 2.50

Chi-Square Values: (5 d.f.) .05 = 11.07
.01 = 15.08

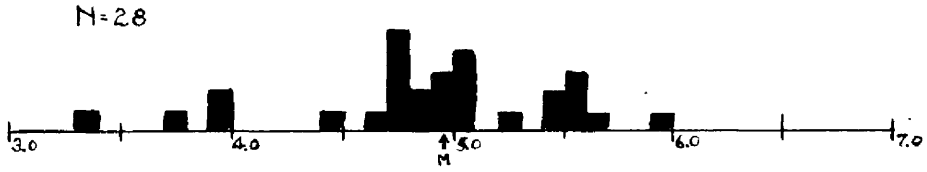
FIG. 15

DISTRIBUTION OF SCORES MADE BY PUPILS OF THE LOWER-LOWER SOCIAL CLASS ON THE PRE-TEST IN ARITHMETIC ACHIEVEMENT (Scores in Terms of Grade-Points)

Experimental Group



Control Group



one case = .10 square inch

TABLE 45

CLASSIFICATION OF SCORES MADE BY
PUPILS OF THE LOWER-LOWER SOCIAL CLASS ON THE
PRE-TEST IN ARITHMETIC ACHIEVEMENT
(Scores in Terms of Grade-Points)

	Scores Falling in Category of				
	3.0-3.9	4.0-4.9	5.0-5.9	6.0-6.9	Total
Experimental Group	5	13	9	1	28
Control Group	4	12	12	0	28
Total	9	25	21	1	56

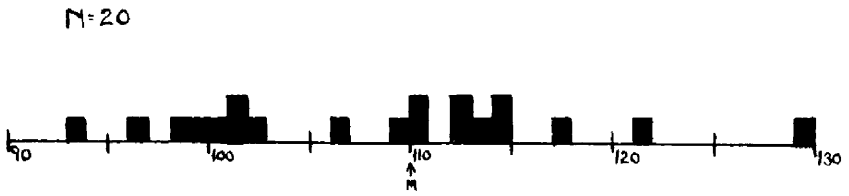
Chi-Square = 1.56

Chi-Square Values: (3 d.f.) .05 = 7.81, .01 = 11.34

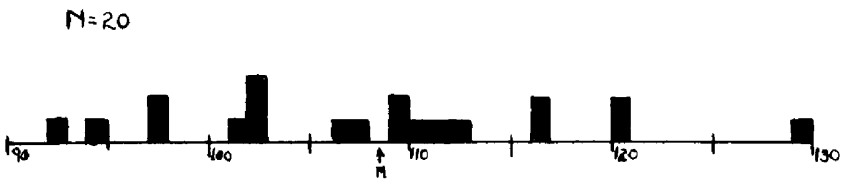
FIG. 16

DISTRIBUTION OF SCORES MADE BY PUPILS OF THE JEWISH RELIGIOUS GROUP ON THE PRE-TEST IN INTELLIGENCE

Experimental Group



Control Group



one case = .10 square inch

TABLE 46

CLASSIFICATION OF SCORES MADE BY
PUPILS OF THE JEWISH RELIGIOUS GROUP ON THE
PRE-TEST IN INTELLIGENCE

	Intelligence Quotients Falling in Category of					
	85-94	95-104	105-114	115-124	125-134	Total
Experimental Group	1	7	9	2	1	20
Control Group	2	6	7	4	1	20
Total	3	13	16	6	2	40

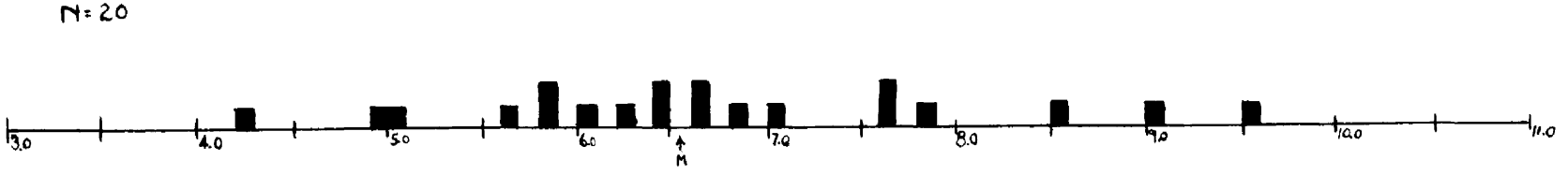
Chi-Square = 1.28

Chi-Square Values: (4 d.f.) .05 = 9.49 .01 = 13.28

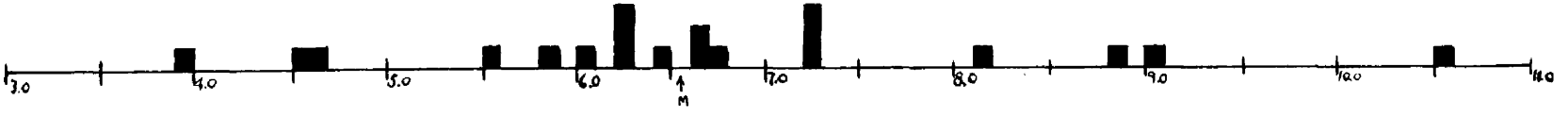
FIG. 17

DISTRIBUTION OF SCORES MADE BY
PUPILS OF THE JEWISH RELIGIOUS GROUP ON THE
PRE-TEST IN READING ACHIEVEMENT
(Scores in Terms of Grade-Points)

Experimental Group



Control Group



one case = .10 square inch

TABLE 47

CLASSIFICATION OF SCORES MADE BY
PUPILS OF THE JEWISH RELIGIOUS GROUP ON THE
PRE-TEST IN READING ACHIEVEMENT
(Scores in Terms of Grade-Points)

	Scores Falling in Category of								
	3.0-3.9	4.0-4.9	5.0-5.9	6.0-6.9	7.0-7.9	8.0-8.9	9.0-9.9	10.0-10.9	Total
Experimental Group	0	2	4	7	4	1	2	0	20
Control Group	1	2	2	8	3	2	1	1	20
Total	1	4	6	15	7	3	3	1	40

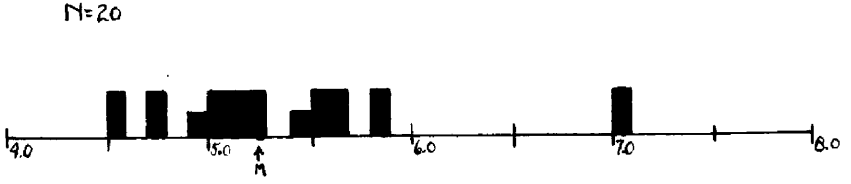
Chi-Square = 3.50

Chi-Square Values: (7 d.f.) .05 = 14.07, .01 = 18.48

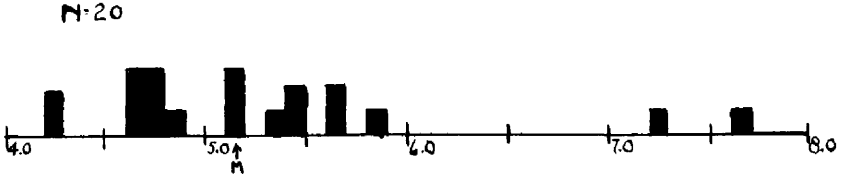
FIG. 18

DISTRIBUTION OF SCORES MADE BY PUPILS OF THE JEWISH RELIGIOUS GROUP ON THE PRE-TEST IN ARITHMETIC ACHIEVEMENT (Scores in Terms of Grade-Points)

Experimental Group



Control Group



one case = .10 square inch

TABLE 48

CLASSIFICATION OF SCORES MADE BY
PUPILS OF THE JEWISH RELIGIOUS GROUP ON THE
PRE-TEST IN ARITHMETIC ACHIEVEMENT
(Scores in Terms of Grade-Points)

	Scores Falling in Category of				
	4.0-4.9	5.0-5.9	6.0-6.9	7.0-7.9	Total
Experimental Group	5	13	0	2	20
Control Group	9	9	0	2	20
Total	14	22	0	4	40

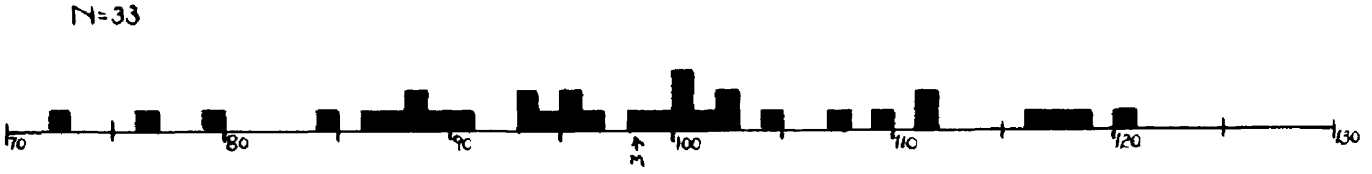
Chi-Square = 1.86

Chi-Square Values: (3 d.f.) .05 = 7.82, .01 = 11.34

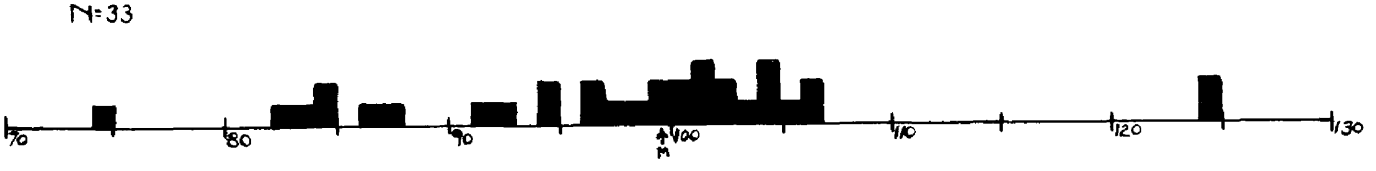
FIG. 19

DISTRIBUTION OF SCORES MADE BY PUPILS OF THE POLISH ETHNIC GROUP ON THE PRE-TEST IN INTELLIGENCE

Experimental Group



Control Group



one case = .10 square inch

TABLE 49

CLASSIFICATION OF SCORES MADE BY
PUPILS OF THE POLISH ETHNIC GROUP ON THE
PRE-TEST IN INTELLIGENCE

	Intelligence Quotients Falling in Category of						
	65-74	75-84	85-94	95-104	105-114	115-124	Total
Experimental Group	1	3	9	12	4	4	33
Control Group	1	4	6	17	3	2	33
Total	2	7	15	29	7	6	66

Chi Square = 2.40

Chi-Square Values: (5 d.f.) .05 = 11.07, .01 = 15.08

FIG. 20

DISTRIBUTION OF SCORES MADE BY
PUPILS OF THE POLISH ETHNIC GROUP ON THE
PRE-TEST IN READING ACHIEVEMENT
(Scores in Terms of Grade-Points)

Experimental Group

Control Group

one case = .10 square inch

TABLE 50

CLASSIFICATION OF SCORES MADE BY
PUPILS OF THE POLISH ETHNIC GROUP ON THE
PRE-TEST IN READING ACHIEVEMENT
(Scores in Terms of Grade-Points)

	Scores Falling in Category of						
	3.0-3.9	4.0-4.9	5.0-5.9	6.0-6.9	7.0-7.9	8.0-8.9	Total
Experimental Group	6	15	6	3	1	2	33
Control Group	4	16	7	5	1	0	33
Total	10	31	13	8	2	2	66

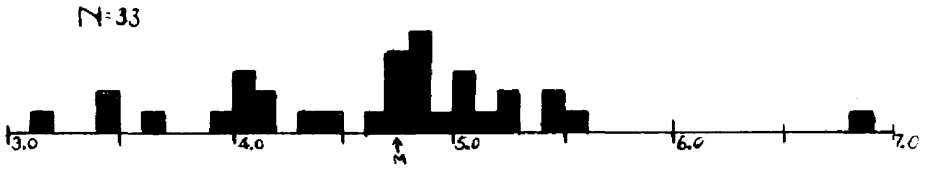
Chi-Square = 2.98

Chi-Square Values: (5 d.f.) .05 = 11.07, .01 = 15.08

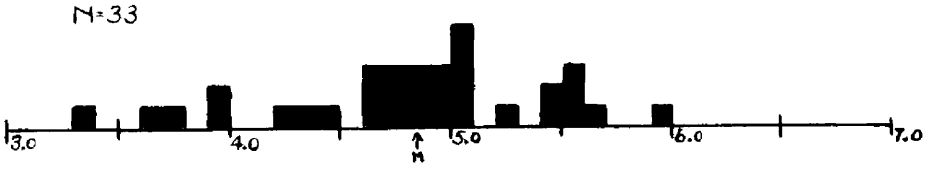
FIG. 21

DISTRIBUTION OF SCORES MADE BY PUPILS OF THE POLISH ETHNIC GROUP ON THE PRE-TEST IN ARITHMETIC ACHIEVEMENT (Scores in Terms of Grade-Points)

Experimental Group



Control Group



one case = .10 square inch

TABLE 51

CLASSIFICATION OF SCORES MADE BY
PUPILS OF THE POLISH ETHNIC GROUP ON THE
PRE-TEST IN ARITHMETIC ACHIEVEMENT
(Scores in Terms of Grade-Points)

	Scores Falling in Category of				
	3.0-3.9	4.0-4.9	5.0-5.9	6.0-6.9	Total
Experimental Group	5	18	9	1	33
Control Group	5	15	13	0	33
Total	10	33	22	1	66

Chi-Square = 1.98

Chi-Square Values: (3 d.f.) .05 = 7.81, .01 = 11.34

FIG. 22

DISTRIBUTION OF SCORES MADE BY PUPILS OF THE 70-89 I.Q. GROUP ON THE PRE-TEST IN READING ACHIEVEMENT (Scores in Terms of Grade-Points)

Experimental Group

Control Group

one case = .10 square inch

TABLE 52

CLASSIFICATION OF SCORES MADE BY PUPILS OF THE 70-89 I.Q. GROUP ON THE PRE-TEST IN READING ACHIEVEMENT (Scores in Terms of Grade-Points)

	Scores Falling in Category of					
	2.0-2.9	3.0-3.9	4.0-4.9	5.0-5.9	6.0-6.9	Total
Experimental Group	0	17	17	3	1	38
Control Group	3	19	8	5	2	37
Total	3	36	25	8	3	75

Chi-Square = 7.69

Chi-Square Values: (4 d.f.) .05 = 9.48 .01 = 13.27

FIG. 23

DISTRIBUTION OF SCORES MADE BY PUPILS OF THE 70-89 I.Q. GROUP ON THE PRE-TEST IN ARITHMETIC ACHIEVEMENT (Scores in Terms of Grade-Points)

Experimental Group

Control Group

one case = .10 square inch

TABLE 53

CLASSIFICATION OF SCORES MADE BY PUPILS OF THE 70-89 I.Q. GROUP ON THE PRE-TEST IN ARITHMETIC ACHIEVEMENT (Scores in Terms of Grade-Points)

	Scores Falling in Category of					
	3.0-3.9	4.0-4.9	5.0-5.9	6.0-6.9	7.0-7.9	Total
Experimental Group	10	24	4	0	0	38
Control Group	21	10	5	0	1	37
Total	31	34	9	0	1	75

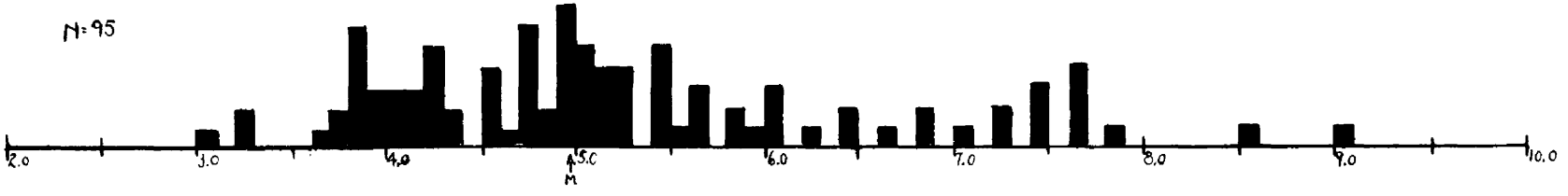
Chi-Square = 10.15

Chi-Square Values: (4 d.f.) .05 = 9.48 .01 = 13.27

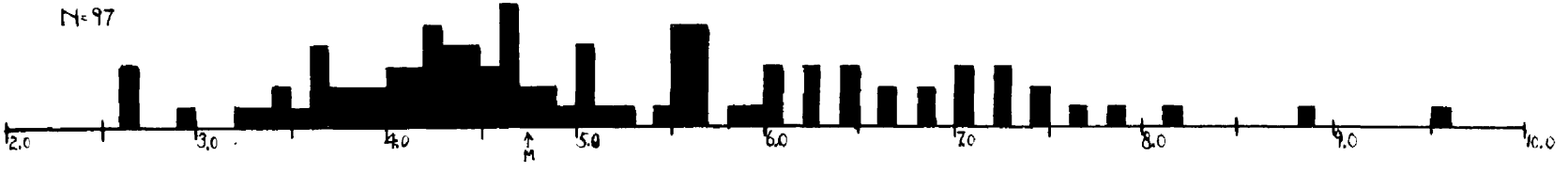
FIG. 24

DISTRIBUTION OF SCORES MADE BY PUPILS OF THE 90-109 I.Q. GROUP ON THE PRE-TEST IN READING ACHIEVEMENT (Scores in Terms of Grade-Points)

Experimental Group



Control Group



one case = .10 square inch

TABLE 54

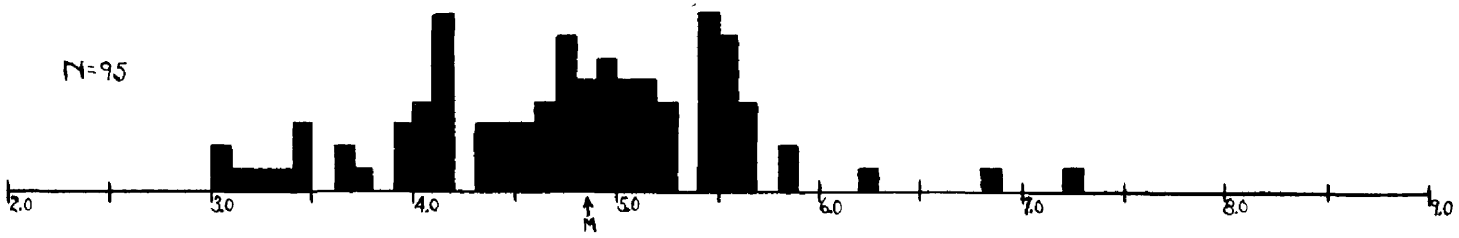
CLASSIFICATION OF SCORES MADE BY
PUPILS OF THE 90-109 I.Q. GROUP ON THE
PRE-TEST IN READING ACHIEVEMENT
(Scores in Terms of Grade-Points)

	Scores Falling in Category of								
	2.0-2.9	3.0-3.9	4.0-4.9	5.0-5.9	6.0-6.9	7.0-7.9	8.0-8.9	9.0-9.9	Total
Experimental Group	0	15	33	25	9	11	1	1	95
Control Group	4	15	33	19	13	10	2	1	97
Total	4	30	66	44	22	21	3	2	192
Chi-Square = 5.85						Chi-Square Values: (7 d.f.)		.05 = 14.06 .01 = 18.47	

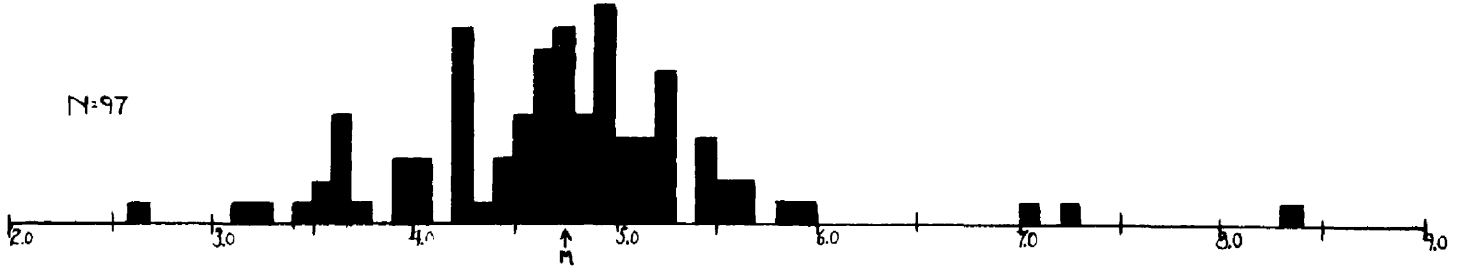
FIG. 25

DISTRIBUTION OF SCORES MADE BY PUPILS OF THE 90-109 I.Q. GROUP ON THE PRE-TEST IN ARITHMETIC ACHIEVEMENT (Scores in Terms of Grade-Points)

Experimental Group



Control Group



one case = .10 square inch

TABLE 55

CLASSIFICATION OF SCORES MADE BY
PUPILS OF THE 90-109 I.Q. GROUP ON THE
PRE-TEST IN ARITHMETIC ACHIEVEMENT
(Scores in Terms of Grade-Points)

	Scores Falling in Category of							
	2.0-2.9	3.0-3.9	4.0-4.9	5.0-5.9	6.0-6.9	7.0-7.9	8.0-8.9	Total
Experimental Group	0	14	43	35	2	1	0	95
Control Group	1	14	53	25	0	3	1	97
Total	1	28	96	60	2	4	1	192

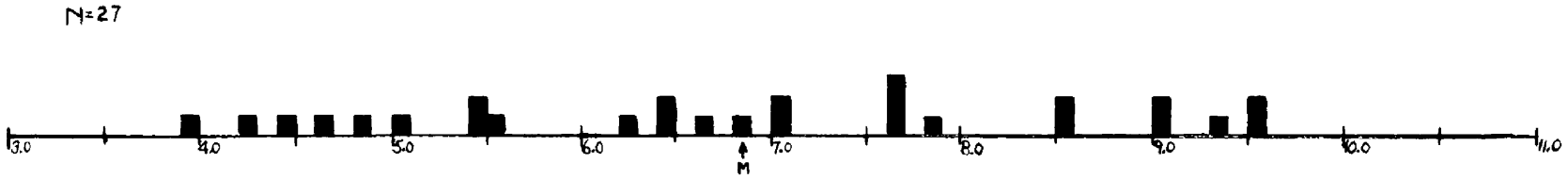
Chi-Square = 7.99

Chi-Square Values: (6 d.f.) .05 = 12.59, .01 = 16.81

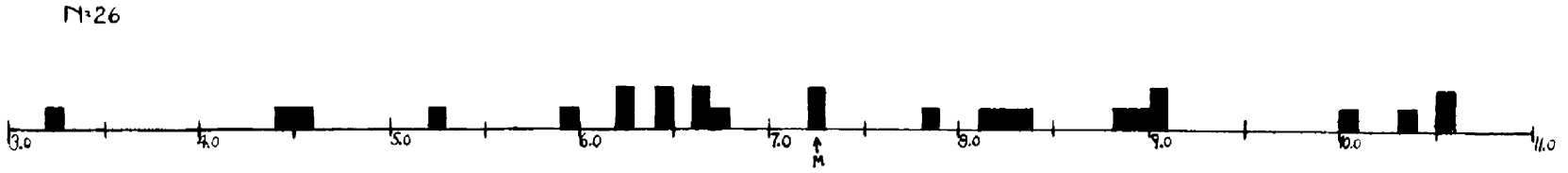
FIG. 26

DISTRIBUTION OF SCORES MADE BY
PUPILS HAVING I.Q.'s 110 AND OVER ON THE
PRE-TEST IN READING ACHIEVEMENT
(Scores in Terms of Grade-Points)

Experimental Group



Control Group



one case = .10 square inch

TABLE 56

CLASSIFICATION OF SCORES MADE BY
PUPILS HAVING I.Q.'s 110 AND OVER ON THE
PRE-TEST IN READING ACHIEVEMENT
(Scores in Terms of Grade-Points)

	Scores Falling in Category of								
	3.0-3.9	4.0-4.9	5.0-5.9	6.0-6.9	7.0-7.9	8.0-8.9	9.0-9.9	10.0-10.9	Total
Experimental Group	1	4	4	5	6	2	5	0	27
Control Group	1	2	2	7	3	5	2	4	26
Total	2	6	6	12	9	7	7	4	53

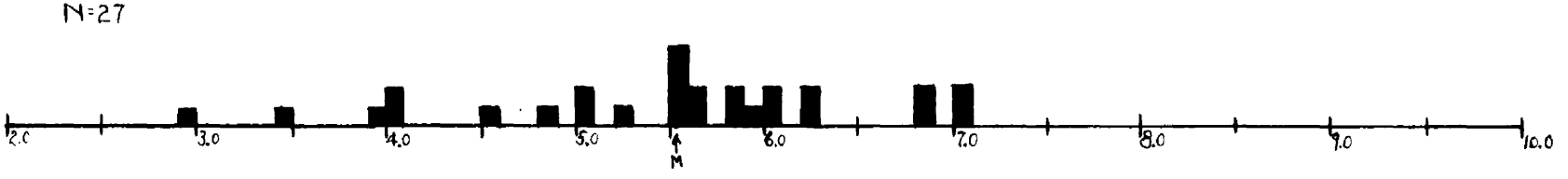
Chi-Square = 10.37

Chi-Square Values: (7 d.f.) .05 = 14.06 .01 = 18.47

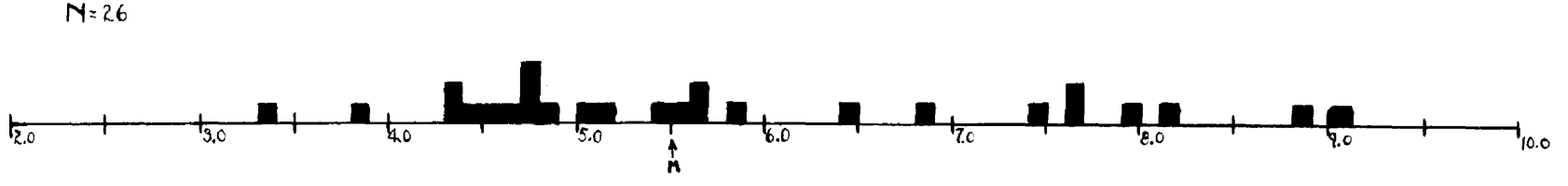
FIG. 27

DISTRIBUTION OF SCORES MADE BY PUPILS HAVING I.Q.'s 110 AND OVER ON THE PRE-TEST IN ARITHMETIC ACHIEVEMENT (Scores in Terms of Grade-Points)

Experimental Group



Control Group



one case = .10 square inch

TABLE 57

CLASSIFICATION OF SCORES MADE BY
PUPILS HAVING I.Q.'s 110 AND OVER ON THE
PRE-TEST IN ARITHMETIC ACHIEVEMENT
(Scores in Terms of Grade-Points)

	Scores Falling in Category of								
	2.0-2.9	3.0-3.9	4.0-4.9	5.0-5.9	6.0-6.9	7.0-7.9	8.0-8.9	9.0-9.9	Total
Experimental Group	1	2	4	12	6	2	0	0	27
Control Group	0	2	8	7	2	4	2	1	26
Total	1	4	12	19	8	6	2	1	53

Chi-Square = 9.84

Chi-Square Values: (7 d.f.) .05 = 14.06, .01 = 18.47

APPENDIX D

FREQUENCY DISTRIBUTIONS AND CONTINGENCY TABLES FOR POST-TEST RESULTS

FIG. 28

DISTRIBUTION OF SCORES MADE BY PUPILS OF THE 70-89 I.Q. GROUP ON THE POST-TEST IN READING ACHIEVEMENT (Scores in Terms of Grade-Points)

Experimental Group

Control Group

one case = .10 square inch

TABLE 58

CLASSIFICATION OF SCORES MADE BY PUPILS OF THE 70-89 I.Q. GROUP ON THE POST-TEST IN READING ACHIEVEMENT (Scores in Terms of Grade-Points)

	Scores Falling in Category of						
	3.0-3.9	4.0-4.9	5.0-5.9	6.0-6.9	7.0-7.9	8.0-8.9	Total
Experimental Group	4	20	12	1	1	0	38
Control Group	9	15	9	3	0	1	37
Total	13	35	21	4	1	1	75

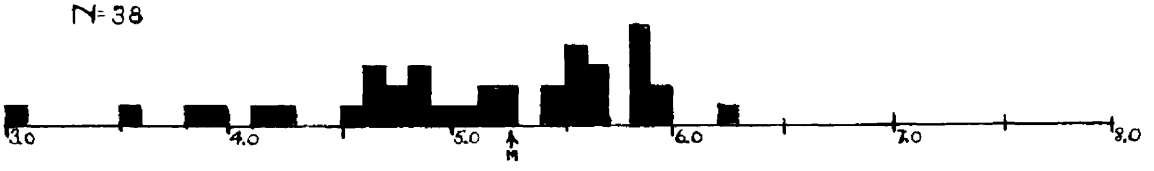
Chi-Square = 6.18

Chi-Square Values: (5 d.f.) .05 = 11.07, .01 = 15.08

FIG. 2 9

DISTRIBUTION OF SCORES MADE BY PUPILS OF THE 70-89 I.Q. GROUP ON THE POST-TEST IN ARITHMETIC ACHIEVEMENT (Scores in Terms of Grade-Points)

Experimental Group



Control Group

one case = .10 square inch

TABLE 59

CLASSIFICATION OF SCORES MADE BY
PUPILS OF THE 70-89 I.Q. GROUP ON THE
POST-TEST IN ARITHMETIC ACHIEVEMENT
(Scores in Terms of Grade-Points)

	Scores Falling in Category of					
	3.0-3.9	4.0-4.9	5.0-5.9	6.0-6.9	7.0-7.9	Total
Experimental Group	3	12	22	1	0	38
Control Group	5	15	14	1	2	37
Total	8	27	36	2	2	75

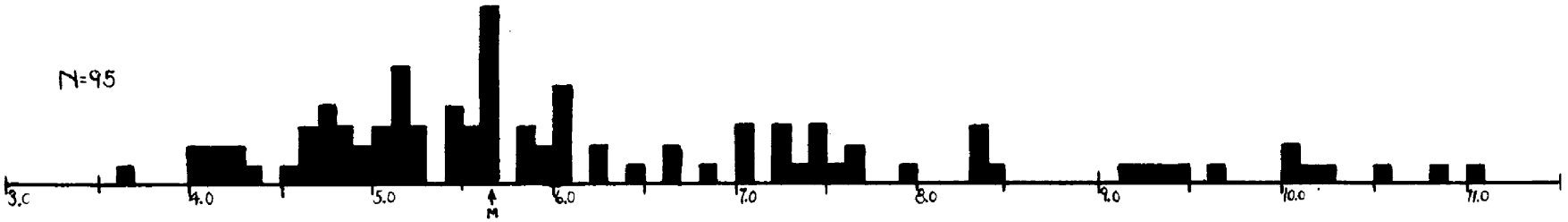
Chi-Square = 5.41

Chi-Square Values: (4 d.f.) .05 = 9.48 .01 = 13.27

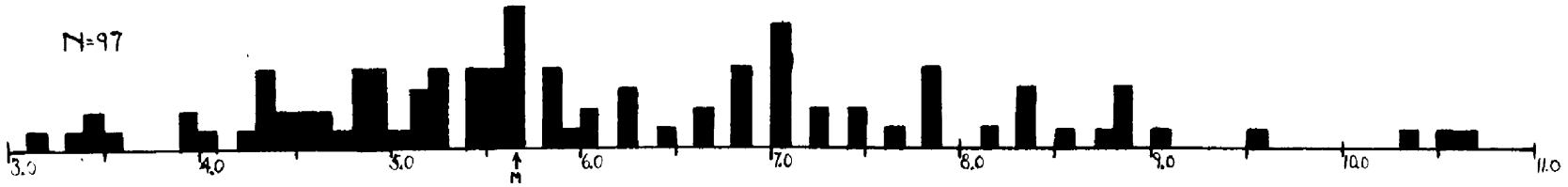
FIG. 30

DISTRIBUTION OF SCORES MADE BY PUPILS OF THE 90-109 I.Q. GROUP ON THE POST-TEST IN READING ACHIEVEMENT (Scores in Terms of Grade-Points)

Experimental Group



Control Group



one case = .10 square inch

TABLE 60

CLASSIFICATION OF SCORES MADE BY PUPILS OF THE 90-109 I.Q. GROUP ON THE POST-TEST IN READING ACHIEVEMENT (Scores in Terms of Grade-Points)

	Scores Falling in Category of									
	3.0-3.9	4.0-4.9	5.0-5.9	6.0-6.9	7.0-7.9	8.0-8.9	9.0-9.9	10.0-10.9	11.0-11.9	Total
Experimental Group	1	20	33	11	14	4	5	6	1	95
Control Group	7	21	28	12	15	9	2	3	0	97
Total	8	41	61	23	29	13	7	9	1	192

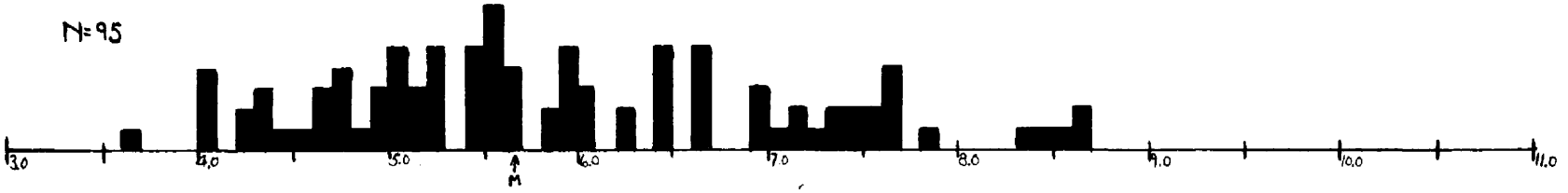
Chi-Square = 11.24

Chi-Square Values: (8 d.f.) .05 = 15.50, .01 = 20.09

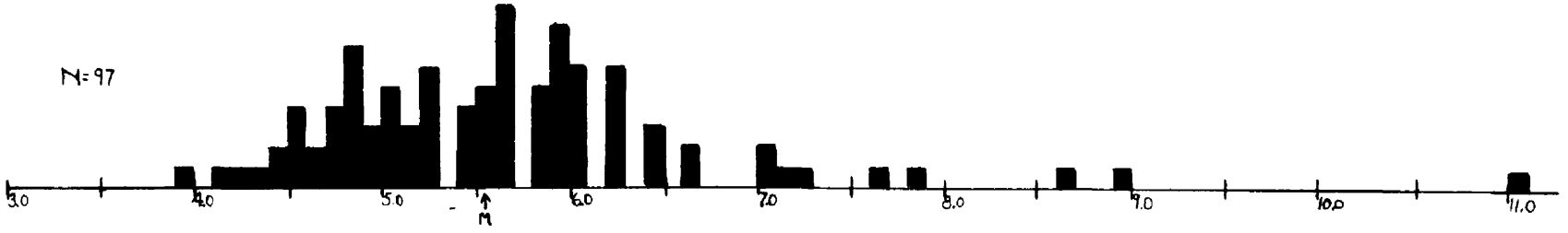
FIG. 31

DISTRIBUTION OF SCORES MADE BY PUPILS OF THE 90-109 I.Q. GROUP ON THE POST-TEST IN ARITHMETIC ACHIEVEMENT
(Scores in Terms of Grade-Points)

Experimental Group



Control Group



one case = .10 square inch

TABLE 61

CLASSIFICATION OF SCORES MADE BY PUPILS OF THE 90-109 I.Q. GROUP ON THE POST-TEST IN ARITHMETIC ACHIEVEMENT (Scores in Terms of Grade-Points)

	Scores Falling in Category of									
	3.0-3.9	4.0-4.9	5.0-5.9	6.0-6.9	7.0-7.9	8.0-8.9	9.0-9.9	10.0-10.9	11.0-11.9	Total
Experimental Group	1	22	36	18	13	5	0	0	0	95
Control Group	1	25	45	17	6	2	0	0	1	97
Total	2	47	81	35	19	7	0	0	1	192

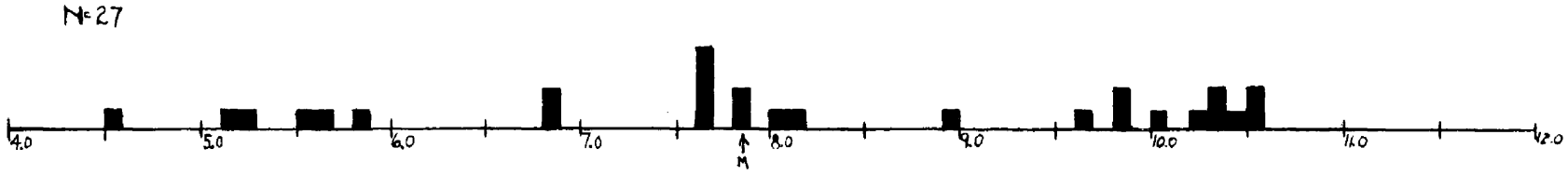
Chi-Square = 6.08

Chi-Square Values: (8 d.f.) .05 = 15.50 .01 = 20.09

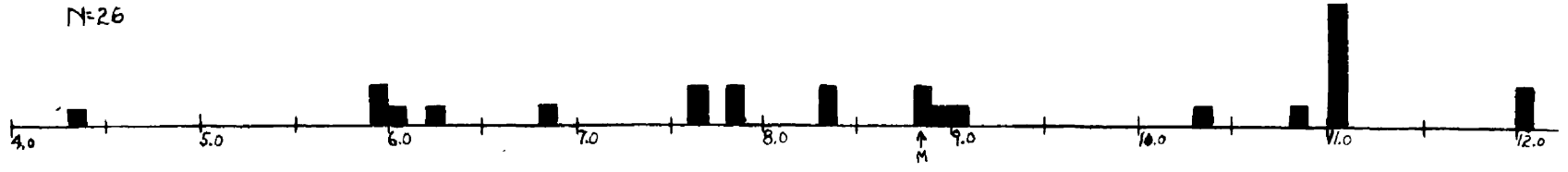
FIG. 32

DISTRIBUTION OF SCORES MADE BY PUPILS HAVING I.Q.'s 110 AND OVER ON THE POST-TEST IN READING ACHIEVEMENT (Scores in Terms of Grade-Points)

Experimental Group



Control Group



one case = .10 square inch

TABLE 62

CLASSIFICATION OF SCORES MADE BY
PUPILS HAVING I.Q.'s 110 AND OVER ON THE
POST-TEST IN READING ACHIEVEMENT
(Scores in Terms of Grade-Points)

	Scores Falling in Category of									
	4.0-4.9	5.0-5.9	6.0-6.9	7.0-7.9	8.0-8.9	9.0-9.9	10.0-10.9	11.0-11.9	12.0-12.9	Total
Experimental Group	1	5	2	6	3	3	7	0	0	27
Control Group	1	2	3	4	5	1	2	6	2	26
Total	2	7	5	10	8	4	9	6	2	53

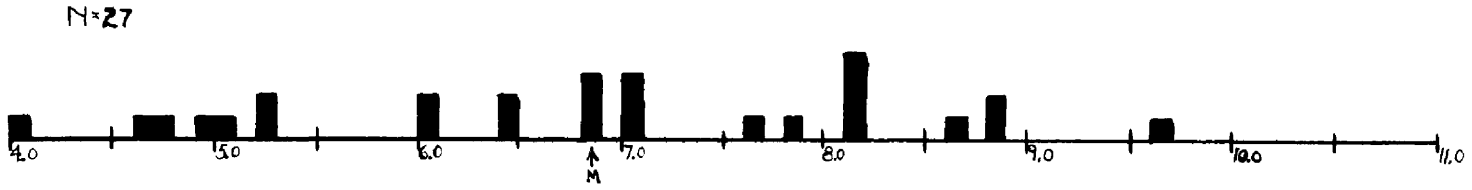
Chi-Square = 15.39

Chi-Square Values: (8 d.f.) .05 = 15.50 .01 = 20.09

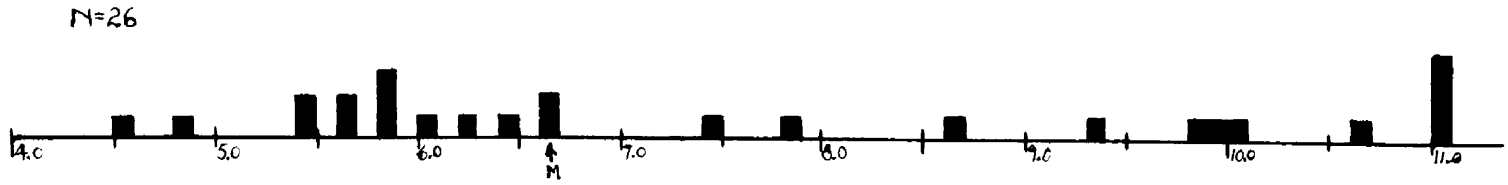
FIG. 33

DISTRIBUTION OF SCORES MADE BY PUPILS HAVING I.Q.'s 110 AND OVER ON THE POST-TEST IN ARITHMETIC ACHIEVEMENT (Scores in Terms of Grade-Points)

Experimental Group



Control Group



one case = .10 square inch

TABLE 63

CLASSIFICATION OF SCORES MADE BY
PUPILS HAVING I.Q.'s 110 AND OVER ON THE
POST-TEST IN ARITHMETIC ACHIEVEMENT
(Scores in Terms of Grade-Points)

	Scores Falling in Category of								
	4.0-4.9	5.0-5.9	6.0-6.9	7.0-7.9	8.0-8.9	9.0-9.9	10.0-10.9	11.0-11.9	Total
Experimental Group	4	3	7	5	7	1	0	0	27
Control Group	2	7	5	2	1	3	2	4	26
Total	6	10	12	7	8	4	2	4	53

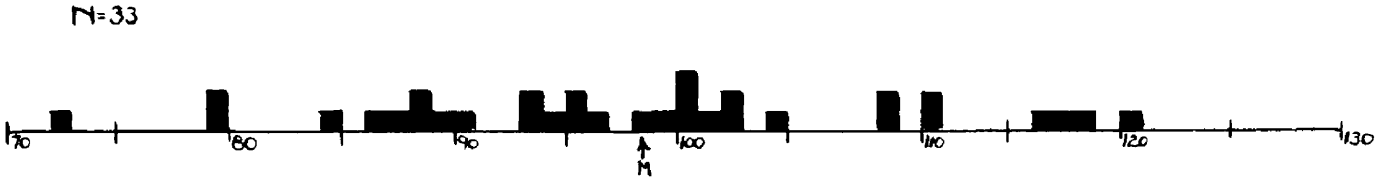
Chi-Square = 15.75

Chi-Square Values: (7 d.f.) .05 = 14.06 .01 = 18.47

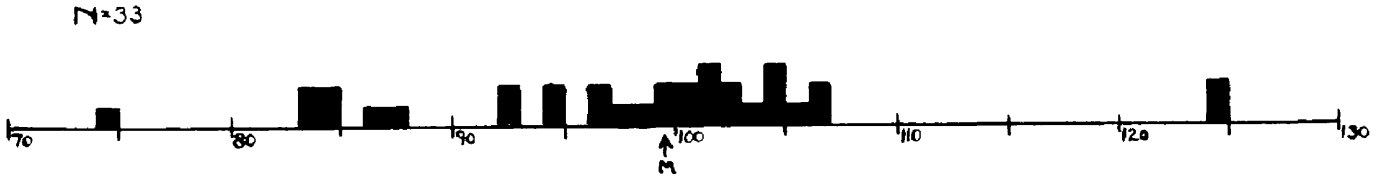
FIG. 34

DISTRIBUTION OF SCORES MADE BY PUPILS OF THE POLISH ETHNIC GROUP ON THE POST-TEST IN INTELLIGENCE

Experimental Group



Control Group



one case = .10 square inch

TABLE 64

CLASSIFICATION OF SCORES MADE BY
PUPILS OF THE POLISH ETHNIC GROUP ON THE
POST-TEST IN INTELLIGENCE

	Intelligence Quotients Falling in Category of								
	65-74	75-84	85-94	95-104	105-114	115-124	125-134	135-144	Total
Experimental Group	1	3	9	12	4	3	0	1	33
Control Group	1	4	6	17	3	2	0	0	33
Total	1	7	15	29	7	5	0	1	66

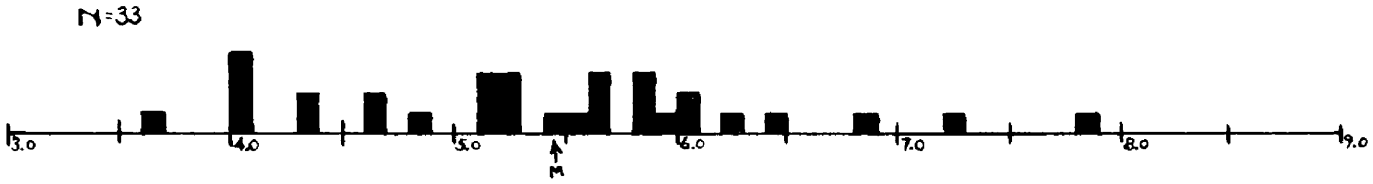
Chi-Square = 2.94

Chi-Square Values: (7 d.f.) .05 = 14.06 .01 = 18.47

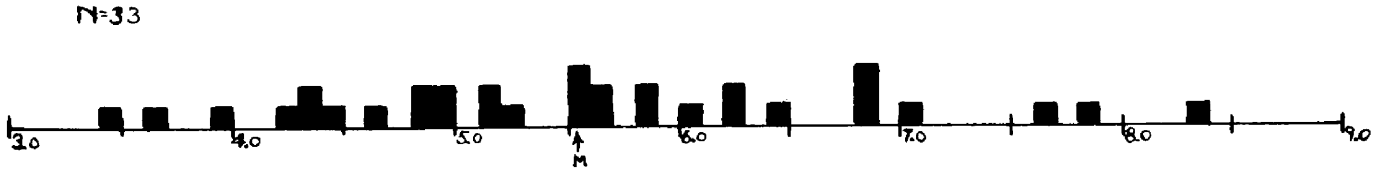
FIG. 35

DISTRIBUTION OF SCORES MADE BY PUPILS OF THE POLISH ETHNIC GROUP ON THE POST-TEST IN READING ACHIEVEMENT (Scores in Terms of Grade-Points)

Experimental Group



Control Group



one case = .10 square inch

TABLE 65

CLASSIFICATION OF SCORES MADE BY
PUPILS OF THE POLISH ETHNIC GROUP ON THE
POST-TEST IN READING ACHIEVEMENT
(Scores in Terms of Grade-Points)

	Scores Falling in Category of								
	3.0-3.9	4.0-4.9	5.0-5.9	6.0-6.9	7.0-7.9	8.0-8.9	9.0-9.9	10.0-10.9	Total
Experimental Group	1	9	15	5	2	0	0	1	33
Control Group	3	9	10	7	3	1	0	0	33
Total	4	18	25	12	5	1	0	1	66

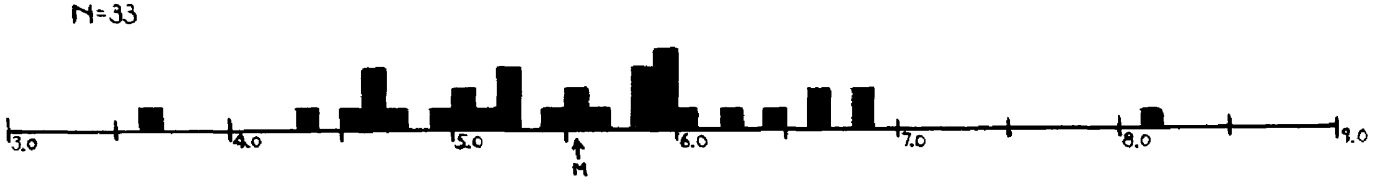
Chi Square = 4.52

Chi-Square Values: (7 d.f.) .05 = 14.06, .01 = 18.47

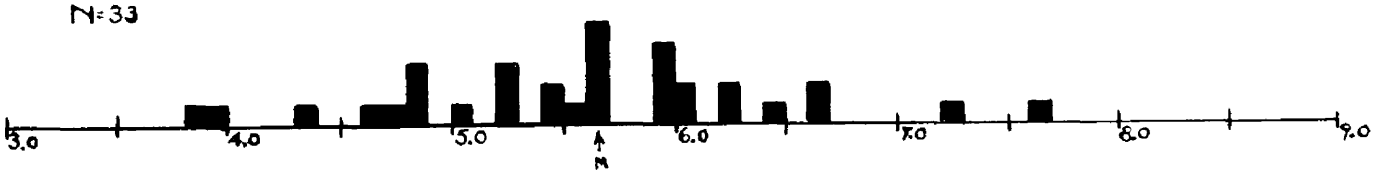
FIG. 36

DISTRIBUTION OF SCORES MADE BY PUPILS OF THE POLISH ETHNIC GROUP ON THE POST-TEST IN ARITHMETIC ACHIEVEMENT (Scores in Terms of Grade-Points)

Experimental Group



Control Group



one case = .10 square inch

TABLE 66

CLASSIFICATION OF SCORES MADE BY
PUPILS OF THE POLISH ETHNIC GROUP ON THE
POST-TEST IN ARITHMETIC ACHIEVEMENT
(Scores in Terms of Grade-Points)

	Scores Falling in Category of						
	3.0-3.9	4.0-4.9	5.0-5.9	6.0-6.9	7.0-7.9	8.0-8.9	Total
Experimental Group	1	7	17	7	0	1	33
Control Group	2	6	16	7	2	0	33
Total	3	13	33	14	2	1	66

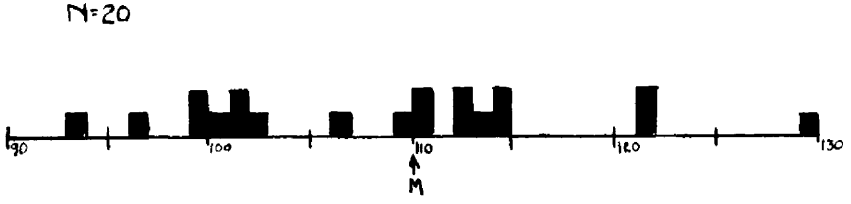
Chi-Square = 3.40

Chi-Square Values: (5 d.f.) .05 = 11.07, .01 = 15.08

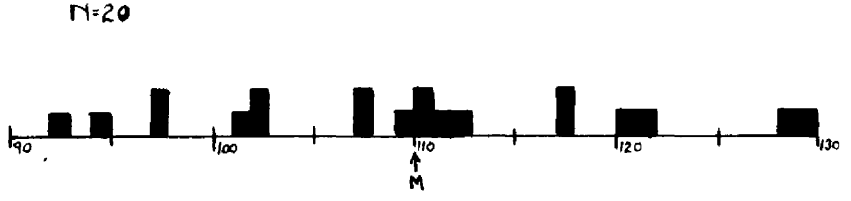
FIG. 37

DISTRIBUTION OF SCORES MADE BY PUPILS OF THE JEWISH RELIGIOUS GROUP ON THE POST-TEST IN INTELLIGENCE

Experimental Group



Control Group



one case = .10 square inch

TABLE 67

CLASSIFICATION OF SCORES MADE BY
PUPILS OF THE JEWISH RELIGIOUS GROUP ON THE
POST-TEST IN INTELLIGENCE

	Intelligence Quotients Falling in Category of					
	85-94	95-104	105-114	115-124	125-134	Total
Experimental Group	1	7	9	2	1	20
Control Group	2	5	7	4	2	20
Total	3	12	16	6	3	40

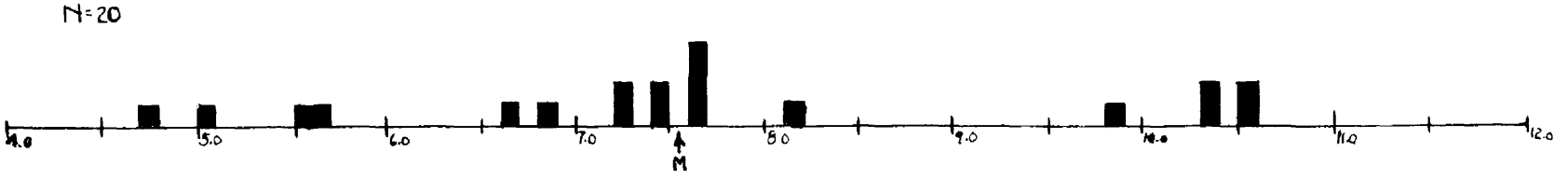
Chi-Square = 1.86

Chi-Square Values: (4 d.f.) .05 = 9.49 .01 = 13.28

FIG. 38

DISTRIBUTION OF SCORES MADE BY
PUPILS OF THE JEWISH RELIGIOUS GROUP ON THE
POST-TEST IN READING ACHIEVEMENT
(Scores in Terms of Grade-Points)

Experimental Group



Control Group

one case = .10 square inch

TABLE 68

CLASSIFICATION OF SCORES MADE BY
PUPILS OF THE JEWISH RELIGIOUS GROUP ON THE
POST-TEST IN READING ACHIEVEMENT
(Scores in Terms of Grade-Points)

	Scores Falling in Category of									
	4.0-4.9	5.0-5.9	6.0-6.9	7.0-7.9	8.0-8.9	9.0-9.9	10.0-10.9	11.0-11.9	12.0-12.9	Total
Experimental Group	1	3	2	8	1	1	4	0	0	20
Control Group	1	2	1	7	4	2	2	0	1	20
Total	2	5	3	15	5	3	6	0	1	40

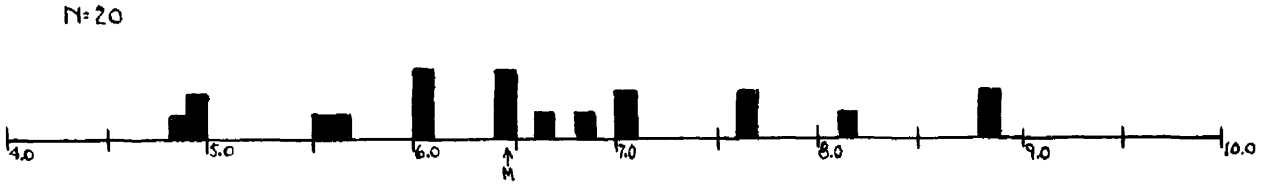
Chi-Square = 4.36

Chi-Square Values: (8 d.f.) .05 = 15.51, .01 = 20.09

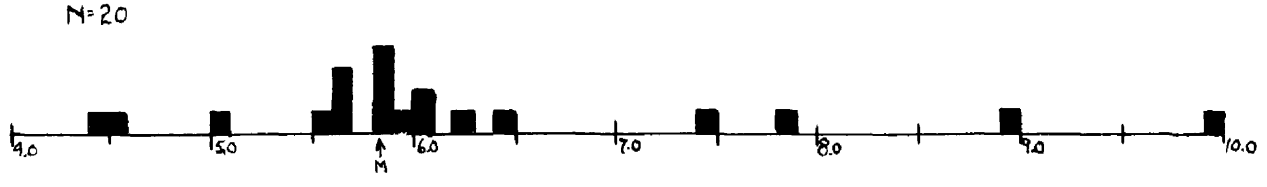
FIG. 39

DISTRIBUTION OF SCORES MADE BY
PUPILS OF THE JEWISH RELIGIOUS GROUP ON THE
POST-TEST IN ARITHMETIC ACHIEVEMENT
(Scores in Terms of Grade-Points)

Experimental Group



Control Group



one case = .10 square inch

TABLE 69

CLASSIFICATION OF SCORES MADE BY
PUPILS OF THE JEWISH RELIGIOUS GROUP ON THE
POST-TEST IN ARITHMETIC ACHIEVEMENT
(Scores in Terms of Grade-Points)

	Scores Falling in Category of						
	4.0-4.9	5.0-5.9	6.0-6.9	7.0-7.9	8.0-8.9	9.0-9.9	Total
Experimental Group	3	2	8	4	3	0	20
Control Group	2	10	4	2	1	1	20
Total	5	12	12	6	4	1	40

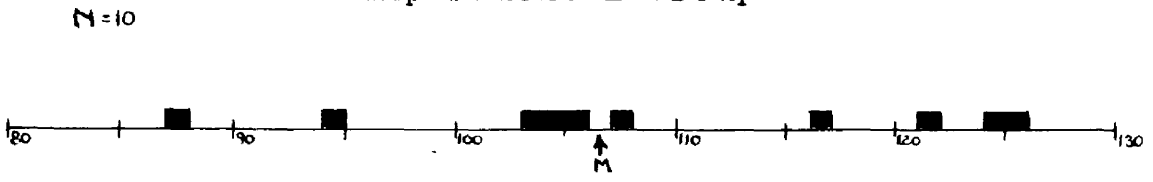
Chi-Square = 9.50

Chi-Square Values: (5 d.f.) .05 = 11.07, .01 = 15.09

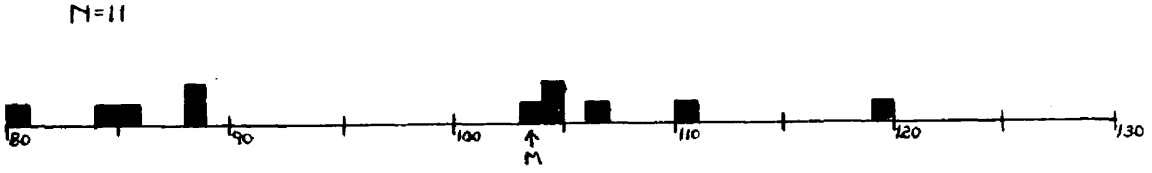
FIG. 40

DISTRIBUTION OF SCORES MADE BY PUPILS OF THE UPPER-MIDDLE SOCIAL CLASS ON THE POST-TEST IN INTELLIGENCE

Experimental Group



Control Group



one case = .10 square inch

TABLE 70

CLASSIFICATION OF SCORES MADE BY
PUPILS OF THE UPPER-MIDDLE SOCIAL CLASS ON THE
POST-TEST IN INTELLIGENCE

	Intelligence Quotients Falling in Category of						
	75-84	85-94	95-104	105-114	115-124	125-134	Total
Experimental Group	0	2	2	2	3	1	10
Control Group	2	3	3	2	1	0	11
Total	2	5	5	4	4	1	21

Chi-Square = 4.36

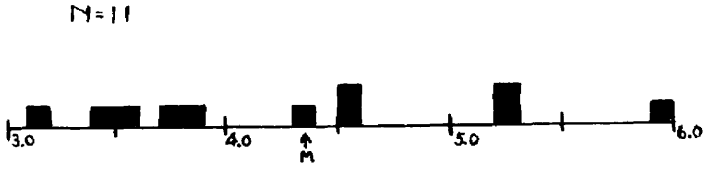
Chi-Square Values: (5 d.f.) .05 = 11.07, .01 = 15.08

FIG. 41

DISTRIBUTION OF SCORES MADE BY PUPILS OF THE UPPER-MIDDLE SOCIAL CLASS ON THE POST-TEST IN READING ACHIEVEMENT (Scores in Terms of Grade-Points)

Experimental Group

Control Group



one case = .10 square inch

TABLE 71

CLASSIFICATION OF SCORES MADE BY PUPILS OF THE UPPER-MIDDLE SOCIAL CLASS ON THE POST-TEST IN READING ACHIEVEMENT
(Scores in Terms of Grade-Points)

	Scores Falling in Category of							
	3.0-3.9	4.0-4.9	5.0-5.9	6.0-6.9	7.0-7.9	8.0-8.9	9.0-9.9	Total
Experimental Group	0	5	3	0	1	0	1	10
Control Group	5	3	3	0	0	0	0	11
Total	5	8	6	0	1	0	1	21

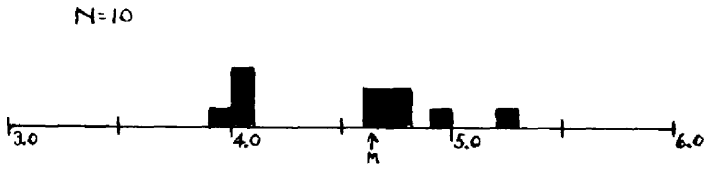
Chi-Square = 7.48

Chi-Square Values: (6 d.f.) .05 = 12.59, .01 = 16.81

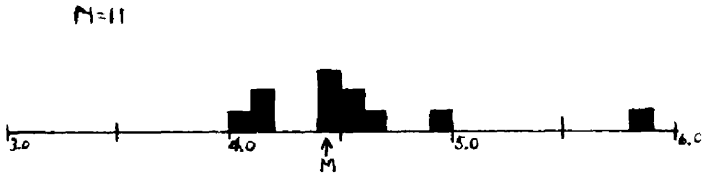
FIG. 42

DISTRIBUTION OF SCORES MADE BY PUPILS OF THE UPPER-MIDDLE SOCIAL CLASS ON THE POST-TEST IN ARITHMETIC ACHIEVEMENT (Scores in Terms of Grade-Points)

Experimental Group



Control Group



one case = .10 square inch

TABLE 72

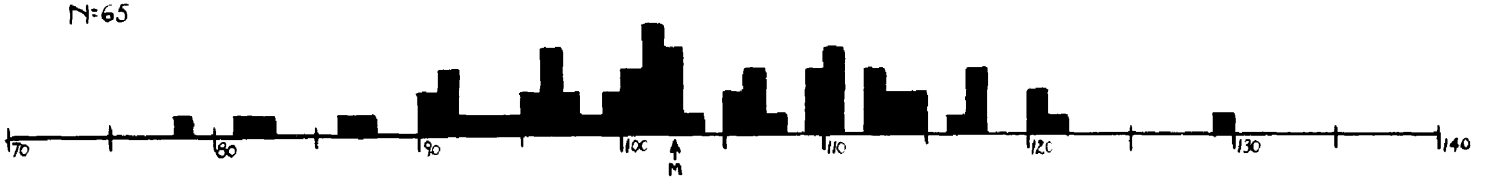
CLASSIFICATION OF SCORES MADE BY
PUPILS OF THE UPPER-MIDDLE SOCIAL CLASS ON THE
POST-TEST IN ARITHMETIC ACHIEVEMENT
(Scores in Terms of Grade-Points)

	Scores Falling in Category of			
	3.0-3.9	4.0-4.9	5.0-5.9	Total
Experimental Group	1	8	1	10
Control Group	0	10	1	11
Total	1	18	2	21
Chi-Square = 1.18			Chi-Square Values: (2 d.f.)	.05 = 5.99 .01 = 9.21

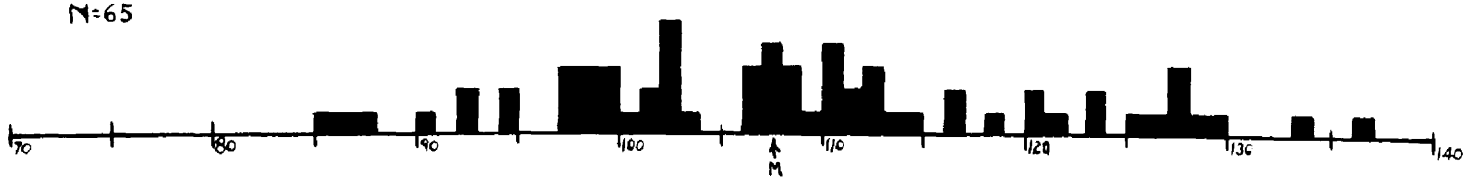
FIG. 43

DISTRIBUTION OF SCORES MADE BY
PUPILS OF THE LOWER-MIDDLE SOCIAL CLASS ON THE
POST-TEST IN INTELLIGENCE

Experimental Group



Control Group



one case = .10 square inch

TABLE 73

CLASSIFICATION OF SCORES MADE BY PUPILS OF THE LOWER-MIDDLE SOCIAL CLASS ON THE POST-TEST IN INTELLIGENCE

	Intelligence Quotients Falling in Category of							
	75-84	85-94	95-104	105-114	115-124	125-134	135-144	Total
Experimental Group	3	10	24	20	7	1	0	65
Control Group	0	8	18	22	8	8	1	65
Total	3	18	42	42	15	9	1	130

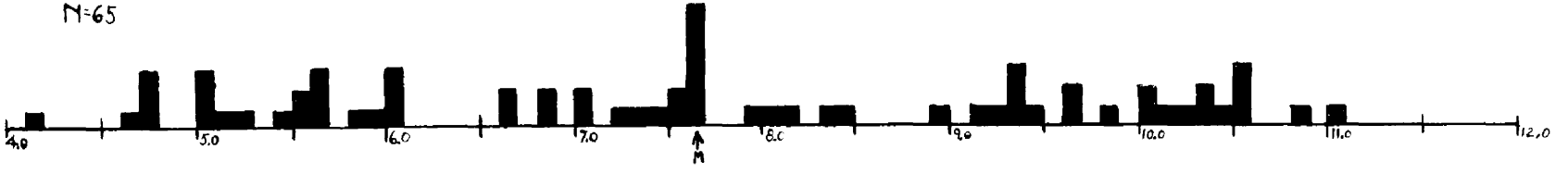
Chi-Square = 9.66

Chi-Square Values: (6 d.f.) .05 = 12.59, .01 = 16.81

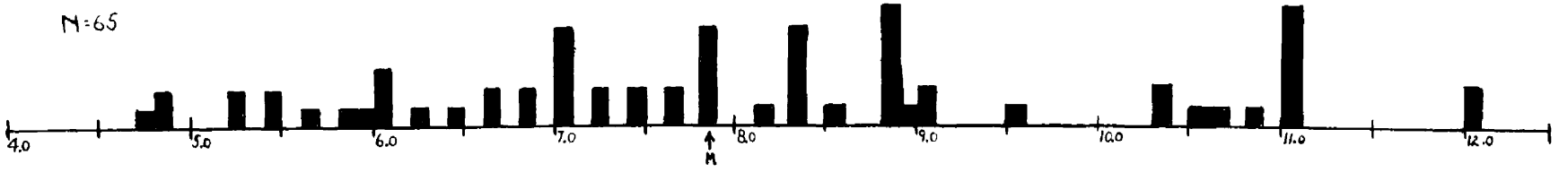
FIG. 44

DISTRIBUTION OF SCORES MADE BY
PUPILS OF THE LOWER-MIDDLE SOCIAL CLASS ON THE
POST-TEST IN READING ACHIEVEMENT
(Scores in Terms of Grade-Points)

Experimental Group



Control Group



one case = .10 square inch

TABLE 74

CLASSIFICATION OF SCORES MADE BY PUPILS OF THE LOWER-MIDDLE SOCIAL CLASS ON THE POST-TEST IN READING ACHIEVEMENT (Scores in Terms of Grade-Points)

	Scores Falling in Category of									
	4.0-4.9	5.0-5.9	6.0-6.9	7.0-7.9	8.0-8.9	9.0-9.9	10.0-10.9	11.0-11.9	12.0-12.9	Total
Experimental Group	5	13	7	14	5	9	11	1	0	65
Control Group	3	7	9	16	14	3	5	6	2	65
Total	8	20	16	30	19	12	16	7	2	130

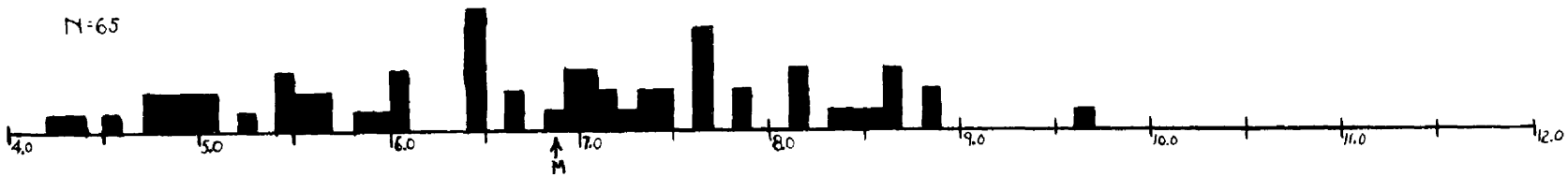
Chi-Square = 17.56

Chi-Square Values: (8 d.f.) .05 = 15.51, .01 = 20.09

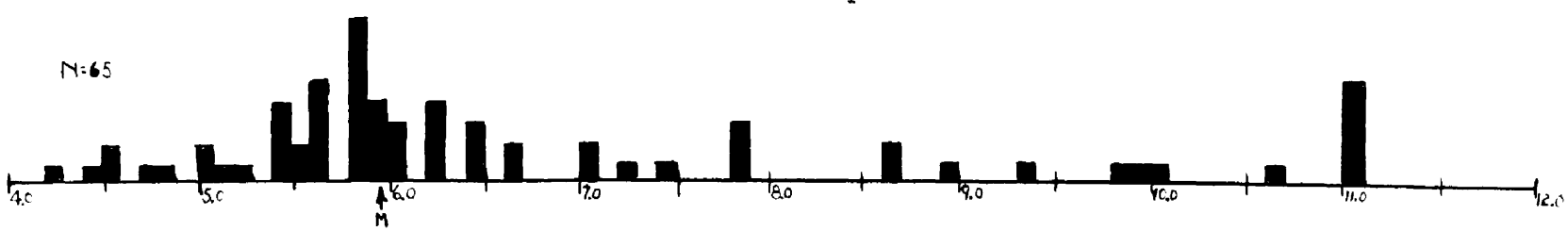
FIG. 45

DISTRIBUTION OF SCORES MADE BY
PUPILS OF THE LOWER-MIDDLE SOCIAL CLASS ON THE
POST-TEST IN ARITHMETIC ACHIEVEMENT
(Scores in Terms of Grade-Points)

Experimental Group



Control Group



one case = .10 square inch

TABLE 75

CLASSIFICATION OF SCORES MADE BY
PUPILS OF THE LOWER-MIDDLE SOCIAL CLASS ON THE
POST-TEST IN ARITHMETIC ACHIEVEMENT
(Scores in Terms of Grade-Points)

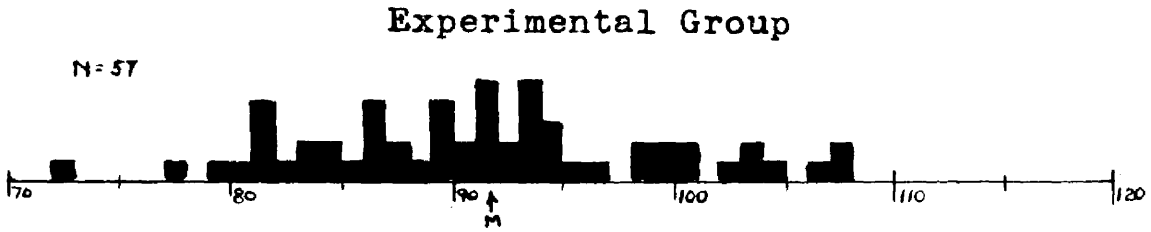
	Scores Falling in Category of								
	4.0-4.9	5.0-5.9	6.0-6.9	7.0-7.9	8.0-8.9	9.0-9.9	10.0-10.9	11.0-11.9	Total
Experimental Group	9	12	15	17	11	1	0	0	65
Control Group	6	27	12	7	3	3	2	5	65
Total	15	39	27	24	14	4	2	5	130

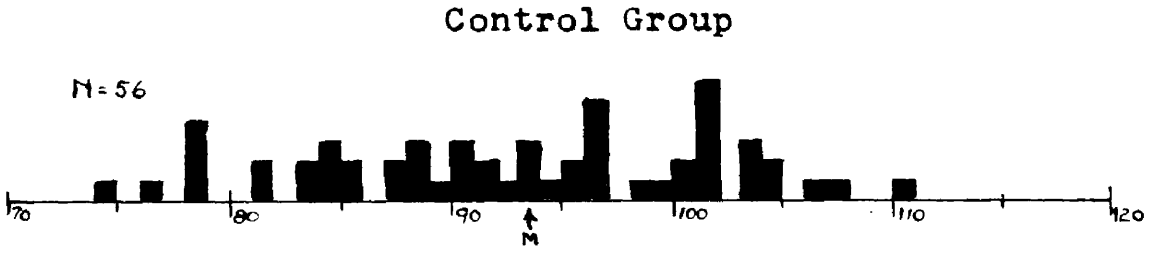
Chi-Square = 23.42

Chi-Square Values: (7 d.f.) .05 = 14.07 .01 = 18.48

FIG. 46

DISTRIBUTION OF SCORES MADE BY PUPILS OF THE UPPER-LOWER SOCIAL CLASS ON THE POST-TEST IN INTELLIGENCE





one case = .10 square inch

TABLE 76

CLASSIFICATION OF SCORES MADE BY
PUPILS OF THE UPPER-LOWER SOCIAL CLASS ON THE
POST-TEST IN INTELLIGENCE

	Intelligence Quotients Falling in Category of					
	65-74	75-84	85-94	95-104	105-114	Total
Experimental Group	1	12	29	12	3	57
Control Group	1	12	18	22	3	56
Total	2	24	47	34	6	113

Chi-Square = 7.32

Chi-Square Values: (4 d.f.) .05 = 9.48 .01 = 13.27

FIG. 47

DISTRIBUTION OF SCORES MADE BY PUPILS OF THE UPPER-LOWER SOCIAL CLASS ON THE POST-TEST IN READING ACHIEVEMENT (Scores in Terms of Grade-Points)

Experimental Group

Control Group

one case = .10 square inch

TABLE 77

CLASSIFICATION OF SCORES MADE BY
PUPILS OF THE UPPER-LOWER SOCIAL CLASS ON THE
POST-TEST IN READING ACHIEVEMENT
(Scores in Terms of Grade-Points)

	Scores Falling in Category of					
	3.0-3.9	4.0-4.9	5.0-5.9	6.0-6.9	7.0-7.9	Total
Experimental Group	4	26	21	2	4	57
Control Group	9	23	22	2	0	56
Total	13	49	43	4	4	113

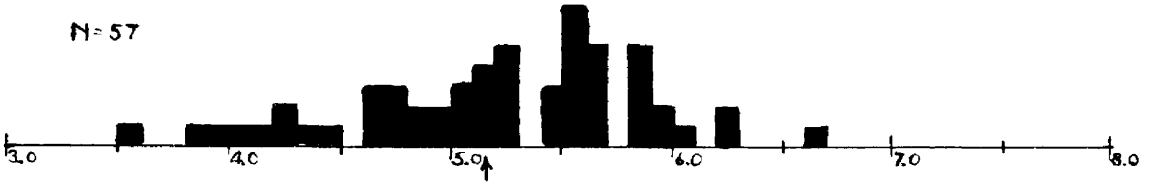
Chi-Square = 6.06

Chi-Square Values: (4 d.f.) .05 = 9.48 .01 = 13.27

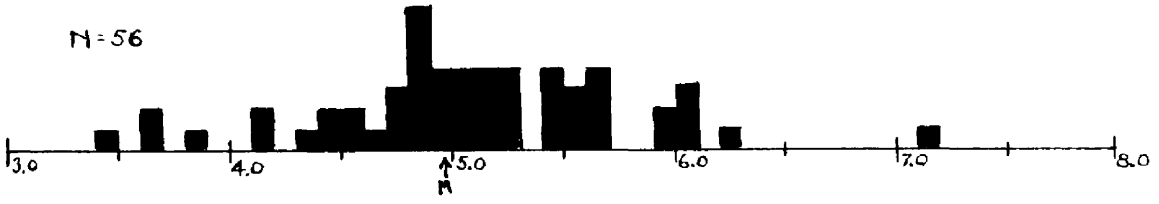
FIG. 48

DISTRIBUTION OF SCORES MADE BY PUPILS OF THE UPPER-LOWER SOCIAL CLASS ON THE POST-TEST IN ARITHMETIC ACHIEVEMENT (Scores in Terms of Grade-Points)

Experimental Group



Control Group



one case = .10 square inch

TABLE 78

CLASSIFICATION OF SCORES MADE BY
PUPILS OF THE UPPER-LOWER SOCIAL CLASS ON THE
POST-TEST IN ARITHMETIC ACHIEVEMENT
(Scores in Terms of Grade-Points)

	Scores Falling in Category of					
	3.0-3.9	4.0-4.9	5.0-5.9	6.0-6.9	7.0-7.9	Total
Experimental Group	3	16	34	4	0	57
Control Group	4	22	25	4	1	56
Total	7	38	59	8	1	113

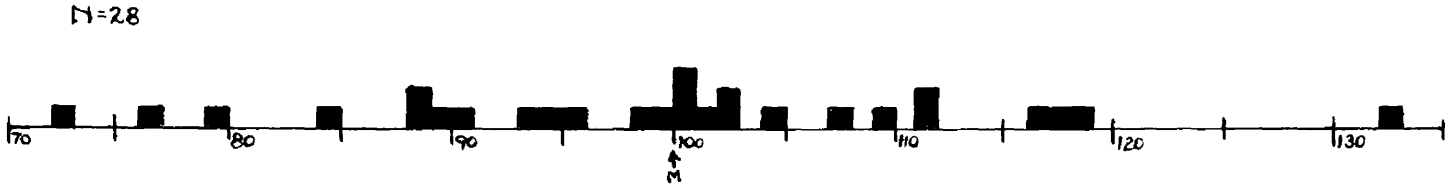
Chi-Square = 3.38

Chi-Square Values: (4 d.f.) .05 = 9.48 .01 = 13.27

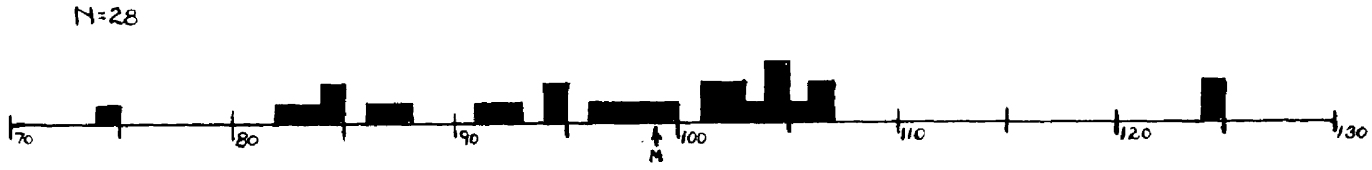
FIG. 49

DISTRIBUTION OF SCORES MADE BY PUPILS OF THE LOWER-LOWER SOCIAL CLASS ON THE POST-TEST IN INTELLIGENCE

Experimental Group



Control Group



one case = .10 square inch

TABLE 79

CLASSIFICATION OF SCORES MADE BY
PUPILS OF THE LOWER-LOWER SOCIAL CLASS ON THE
POST-TEST IN INTELLIGENCE

	Intelligence Quotients Falling in Category of							
	65-74	75-84	85-94	95-104	105-114	115-124	125-134	Total
Experimental Group	1	3	6	10	4	3	1	28
Control Group	1	4	6	12	3	2	0	28
Total	2	7	12	22	7	5	1	56

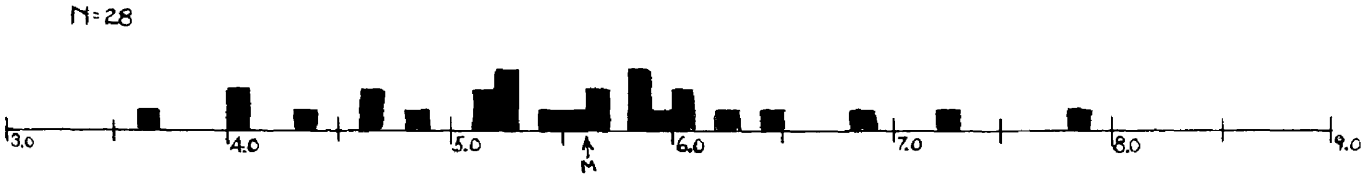
Chi-Square = 7.34

Chi-Square Values: (6 d.f.) .05 = 12.59 .01 = 16.81

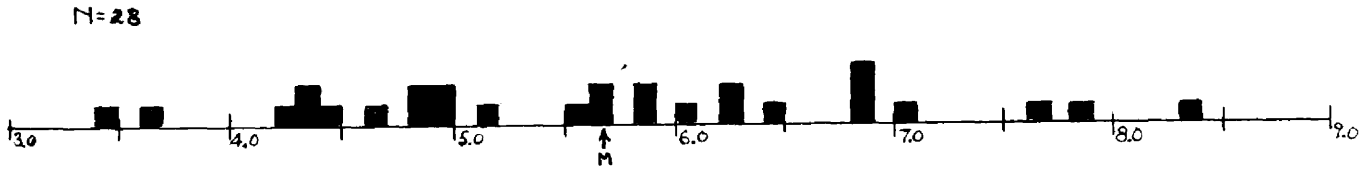
FIG. 50

DISTRIBUTION OF SCORES MADE BY PUPILS OF THE LOWER-LOWER SOCIAL CLASS ON THE POST-TEST IN READING ACHIEVEMENT (Scores in Terms of Grade-Points)

Experimental Group



Control Group



one-case = .10 square inch

TABLE 80

CLASSIFICATION OF SCORES MADE BY
PUPILS OF THE LOWER-LOWER SOCIAL CLASS ON THE
POST-TEST IN READING ACHIEVEMENT
(Scores in Terms of Grade-Points)

	Scores Falling in Category of						
	3.0-3.9	4.0-4.9	5.0-5.9	6.0-6.9	7.0-7.9	8.0-8.9	Total
Experimental Group	1	7	13	5	2	0	28
Control Group	2	9	6	7	3	1	28
Total	3	16	19	12	5	1	56

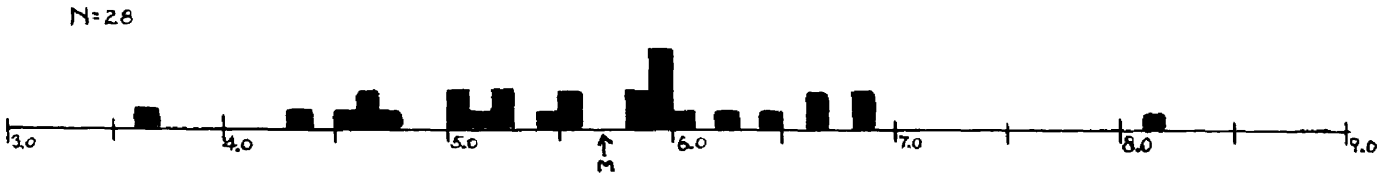
Chi-Square = 4.64

Chi-Square Values: (5 d.f.) .05 = 11.07, .01 = 15.08

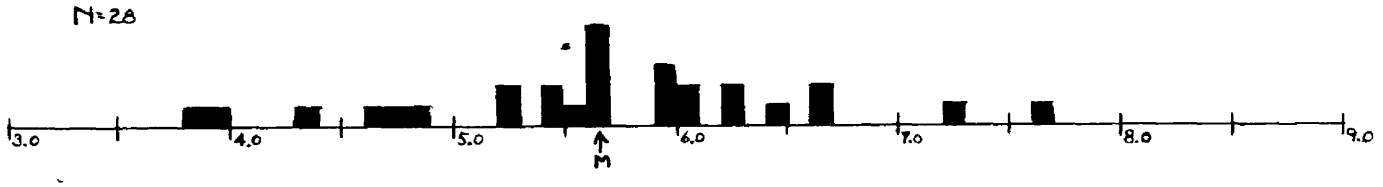
FIG. 51

DISTRIBUTION OF SCORES MADE BY PUPILS OF THE LOWER-LOWER SOCIAL CLASS ON THE POST-TEST IN ARITHMETIC ACHIEVEMENT (Scores in Terms of Grade-Points)

Experimental Group



Control Group



one case = .10 square inch

TABLE 81

CLASSIFICATION OF SCORES MADE BY
PUPILS OF THE LOWER-LOWER SOCIAL CLASS ON THE
POST-TEST IN ARITHMETIC ACHIEVEMENT
(Scores in Terms of Grade-Points)

	Scores Falling in Category of						
	3.0-3.9	4.0-4.9	5.0-5.9	6.0-6.9	7.0-7.9	8.0-8.9	Total
Experimental Group	1	5	14	7	0	1	28
Control Group	2	4	13	7	2	0	28
Total	3	9	27	14	2	1	56

Chi-Square = 3.46

Chi-Square Values: (5 d.f.) .05 = 11.07, .01 = 15.08

APPENDIX E

TEACHER'S CLASS ANALYSIS CHART

City of Baltimore - Department of Education - Bureau of Research

TEACHER'S CLASS

STANFORD INTERMEDIATE READING TEST: FORM ____

Final School Mark Previous Term	Identification No.	Pupils' Names *Listed Alphabetically* — The number of a pupil serves as identification in this chart.	Intelligence Quotient Kuhlmann-Anderson I.Q.	Chronological Age C.A.	Mental Age M.A.	Estimated Grade Level	Paragraph Meaning No. Each	Paragraph Meaning Score	Word Meaning No. Each	Word Meaning Score	Average Reading No. Each	Average Reading Score	Average Reading Grade Equiv
	1		Over 135	15-8 and over	15-8 and over	10A & Over		76 & Over		76 & Over		76 & Over	10.5& Over
	2		134										
	3		133	15-7 to 15-3	15-7 to 15-3	10B		75		75		75	10.3
	4		132					74		74		74	10.0
	5		131	15-2 to 14-10	15-2 to 14-10	9A		73		73		73	9.8
	6		130					72		72		72	9.5
	7		129	14-9 to 14-5	14-9 to 14-5	9B		71		71		71	9.3
	8		128					70		70		70	9.0
	9		127 X	14-4 14-3 14-2 14-1 14-0 13-11	14-4 14-3 14-2 14-1 14-0 13-11	8A		69		69		69	8.9 8.8 8.7 8.6
	10		126					68		68		68	8.5
	11		125	13-10 13-9 13-8 13-7 13-6	13-10 13-9 13-8 13-7 13-6	8B		67		67		67	8.4 8.3 8.2
	12		124					66		66		66	8.1 8.0
	13		123	13-5 13-4 13-3 13-2 13-1 13-0	13-5 13-4 13-3 13-2 13-1 13-0	7A		65		65		65	7.9 7.8 7.7
	14		122					64		64		64	7.6 7.5
	15		121	12-11 12-10 12-9 12-8 12-7	12-11 12-10 12-9 12-8 12-7	7B		63		63		63	7.4 7.3
	16		120					62		62		62	7.2 7.1
	17		119					61		61		61	7.0
	18		118	12-8 12-5 12-4 12-3 12-2 12-1	12-8 12-5 12-4 12-3 12-2 12-1	6A		60		60		60	6.9 6.8 6.7
	19		117					59		59		59	6.6 6.5
	20		116	12-0 11-11 11-10 11-9 11-8 11-7	12-0 11-11 11-10 11-9 11-8 11-7	6B		58		58		58	6.4 6.3
	21		115					57		57		57	6.2 6.1
	22		114					56		56		56	6.0
	23		113	11-6 11-5 11-4 11-3 11-2 11-1 11-0	11-6 11-5 11-4 11-3 11-2 11-1 11-0	5A		55		55		55	5.9
	24		112					54		54		54	5.8 ← 6A Mdn** 5.7
	25		111					53		53		53	5.6 ← 6B Mdn**
	26		110					52		52		52	5.5
	27		109	10-11 10-10 10-9 10-8 10-7 10-6 10-5	10-11 10-10 10-9 10-8 10-7 10-6 10-5	5B		51		51		51	5.4 5.3
	28		108 Y+					50		50		50	5.2
	29		107					49		49		49	5.1
	30		106					48		48		48	5.0
	31		105	10-4 10-3 10-2 10-1 10-0 9-11	10-4 10-3 10-2 10-1 10-0 9-11	4A		47		47		47	4.9 ← 5A Mdn**
	32		104					46		46		46	4.8
	33		103					45		45		45	4.7
	34		102					44		44		44	4.6 ← 5B Mdn**
	35		101					43		43		43	4.5
	36		100	9-10 9-9 9-8 9-7 9-6 9-5 9-4	9-10 9-9 9-8 9-7 9-6 9-5 9-4	4B		42		42		42	4.4 ← 5B Mdn**
	37		99 Y					41		41		41	4.3
	38		98					40		40		40	4.2
	39		97					39		39		39	4.1
	40		96					38		38		38	4.0
	41		95	9-3 9-2 9-1 9-0 8-11 8-10 8-9	9-3 9-2 9-1 9-0 8-11 8-10 8-9	3A		37		37		37	3.9
	42		94					36		36		36	3.8
	43		93					35		35		35	3.7
	44		92 Y-					34		34		34	3.6
	45		91					33		33		33	3.5
	46		90	8-9 8-7 8-6 8-5 8-4 8-3	8-9 8-7 8-6 8-5 8-4 8-3	3B		31-32		31-32		31-32	3.4
	47		89					30		30		30	3.3
	48		88					29		29		29	3.2
	49		87					28		28		28	3.1
	50		86					26-27		26-27		26-27	3.0
	51		85	8-2 8-1 8-0 7-11 7-10 7-9 7-8	8-2 8-1 8-0 7-11 7-10 7-9 7-8	2A		24-25		24-25		24-25	2.9
	52		84					23		23		23	2.8
	53		83					22		22		22	2.7
			82					20-21		20-21		20-21	2.6
			81					19		19		19	2.5
			80 Z										
			79										
			78										
			77										
			76										
			75										
			74										
			73										
			72										
			71										
			70										
			69										
			68										
			67										
			66										
			65										
			64										
			63										
			62										
			61										
			60										
			Under										

Date of Test.....

Teacher.....

Grade.....School No..... Examiner.....

** Based on the results for all Balto. children tested in

TEACHER'S CLASS ANALYSIS CHART FOR GRADES 5 & 6 ONLY TCAC Form 224-9-49

; TEST: FORM _____ STANFORD INTERMEDIATE ARITHMETIC TEST: Form _____

Average Reading				Arithmetic Reasoning				Arithmetic Computation				Average Arithmetic				
	No. Each	Score	Grade Equiv.		No. Each	Score		No. Each	Score		No. Each	Score	Grade Equiv.		U.S. Gr. Levels
		76 & Over	10.5& Over			76 & Over			76 & Over			76 & Over	10.5& Over		10A & Over
		75	10.3			75			75			75	10.3		10B
		74	10.0			74			74			74	10.0		
		73	9.8			73			73			73	9.8		9A
		72	9.5			72			72			72	9.5		
		71	9.3			71			71			71	9.3		9B
		70	9.0			70			70			70	9.0		
			8.9										8.9		
		69	8.8			69			69			69	8.8		
			8.7										8.7		8A
			8.6										8.6		
		68	8.5			68			68			68	8.5		
			8.4										8.4		
		67	8.3			67			67			67	8.3		
			8.2										8.2		8B
		66	8.1			66			66			66	8.1		
			8.0										8.0		
			7.9										7.9		
		65	7.8			65			65			65	7.8		
			7.7										7.7		7A
		64	7.6			64			64			64	7.6		
			7.5										7.5		
		63	7.4			63			63			63	7.4		
			7.3										7.3		
		62	7.2			62			62			62	7.2		7B
			7.1										7.1		
		61	7.0			61			61			61	7.0		
			6.9										6.9		
		60	6.8			60			60			60	6.8		
			6.7										6.7		6A
		59	6.6			59			59			59	6.6		
			6.5										6.5		
		58	6.4			58			58			58	6.4		
			6.3										6.3		
		57	6.2			57			57			57	6.2		6B
			6.1										6.1		
		56	6.0			56			56			56	6.0		
		55	5.9			55			55			55	5.9		
		54	5.8	← 6A Mdn**		54			54			54	5.8	← 6A Mdn**	
			5.7										5.7		5A
		53	5.6	← 6B Mdn**		53			53			53	5.6		
		52	5.5			52			52			52	5.5	← 6B Mdn**	
		51	5.4			51			51			51	5.4		
			5.3										5.3		
		50	5.2			50			50			50	5.2		5B
		49	5.1			49			49			49	5.1		
		48	5.0			48			48			48	5.0		
		47	4.9	← 5A Mdn**		47			47			47	4.9		
		46	4.8			46			46			46	4.8	← 5A Mdn**	
		45	4.7			45			45			45	4.7		4A
		44	4.6	← 5B Mdn**		44			44			44	4.6		
		43	4.5			43			43			43	4.5	← 5B Mdn**	
		42	4.4	← 5B Mdn**		42			42			42	4.4		
		41	4.3			41			41			41	4.3		
		40	4.2			40			40			40	4.2		4B
		39	4.1			39			39			39	4.1		
		38	4.0			38			38			38	4.0		
		37	3.9			37			37			37	3.9		
		36	3.8			36			36			36	3.8		
		35	3.7			35			35			35	3.7		3A
		34	3.6			34			34			34	3.6		
		33	3.5			33			33			33	3.5		
		31-32	3.4			31-32			31-32			31-32	3.4		
		30	3.3			30			30			30	3.3		
		29	3.2			29			29			29	3.2		3B
		28	3.1			28			28			28	3.1		
		26-27	3.0			26-27			26-27			26-27	3.0		
		24-25	2.9			24-25			24-25			24-25	2.9		
		23	2.8			23			23			23	2.8		
		22	2.7			22			22			22	2.7		2A
		20-21	2.6			20-21			20-21			20-21	2.6		
		19	2.5			19			19			19	2.5		

the results for all Balto. children tested in the respective grades in Sept. 1948 with Form ~~D~~ H